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Hon. Charles S. MacNaughton, Treasurer of Ontario
H. Ian Macdonald, Deputy Minister

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The Economy in 1967

Sid Dolgoy, *Editor*

Ontario Economic Review

Selected Economic Indicators

A publication of the
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Hon. Charles S. MacNaughton

Treasurer of Ontario

H. Ian Macdonald

Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Treasury Department (Finance and Economics). The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About the Review

This first issue of the *Ontario Economic Review* under the Treasury Department (Finance and Economics) introduces a new look to the publication along with expanded economic coverage. A new regular feature will be the group of business cycle indicators presented in graphic form and intended to provide information for the analysis of trends in the economy.

As has been customary, the first issue of the year contains an annual review of the economy with, where possible, specific reference to Ontario.

The article appearing in this issue was prepared by Sid Dolgoy, who departs as editor of the *Ontario Economic Review* to join the Department's Economic Planning Branch.

Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity commonly used to define business cycles not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some may change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate – because they relate to future rather than present production – are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used – 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) – only the logarithmic scales can be used to compare relative changes in different indicators. *this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



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lgooy, Editor
o Economic Review

ians enjoyed yet another year of eco-
prosperity in 1967, their seventh since
But the economy's performance was
m an unqualified success.

e, the economy did continue to move
d, with production, employment and in-
all reaching record high levels in 1967:
national product, the total value of all
and services produced, climbed to
billion, a gain of 6.8 per cent over
employment across the nation expand-
a full 227,000; and personal income
ever higher, exceeding \$2,300 for every
woman and child.

these seemingly impressive gains begin
bear illusory when coupled with other
sobering observations. Though output
1966's all-time high, it did so just
y, attaining a far-from-outstanding
h rate — one much lower than in pre-
g years. Real growth — the percentage
se in actual volume of output — was only
er cent in 1967, a far cry from the aver-
annual gains of approximately 6.2 per
recorded between 1962 and 1966. Ac-
anying this relatively low rate of ad-
was a near four per cent increase in
— perhaps the most significant single
marring the economy's performance
year. And though employment rose
ntially, the size of the labour force in-
ed even more, producing a higher unem-
ent rate in Canada.

tario too experienced a lower rate of
h — as, in fact, did the United States
many other industrialized nations. But
provincial slowdown was less severe than
of the entire nation, mainly because of
rio's basic economic stability. Gross pro-
al product rose from \$23.1 billion in
to \$24.9 billion last year, a gain of 7.8
ent. This fell short of the 10.0 per cent
experienced in 1966, but represented
of a drop than Canada's decline from a
per cent gain in 1966 to a less than
per cent gain last year. While Canada's
growth rate was 2.8 per cent last year,
rio's was 3.7 per cent. In almost all
ures of economic activity, Ontario's
exceeded those of Canada as a whole.
meant that Ontario — one of the nation's
ng growth areas and one accounting for
fifths of total production — was a major
ibutor to the nation's overall growth.

Ontario: A Major Contributor to Overall Economic Gains in Canada

Annual Growth 1967/66

% 0 5 10 20 30

Labour Force



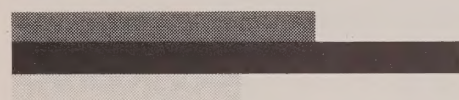
Employment



Value of Manufacturing Shipments



Housing Starts



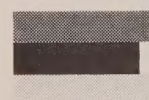
Mineral Production



Farm Cash Receipts



Wages and Salaries



Retail Trade



Canada
Ontario
Canada less Ontario

International developments: a mixture of promises and problems

The world economy faced a unique mixture of promises and problems in 1967. The conclusion of the Kennedy Round of tariff negotiations finally crystallized international agreement on wide-ranging tariff cuts, holding out the promise of fewer barriers to trade and greater international economic rationalization. The setting up of plans to create Special Drawing Rights at the International Monetary Fund was another important development, in this case promising to help establish international financial stability. (These plans took on added importance when they became a vital element in the recent battle to restore confidence in paper currency.)

Among the leading problems, the continuing British economic crisis was perhaps the most outstanding, leading as it did to the devaluation of the British pound in November. Though devaluation was an important step toward solving Britain's persistent economic ills, it did — in the short run at least — undermine the competitive position of Britain's trading partners.¹ Fortunately Canada did not have to face the prospect of making major readjustments, principally because its exports to Britain have consisted mainly of primary products, the demand for which is inelastic and which have few substitutes.

Another problem was created by the year-end announcement that the United States intended to adopt strict measures to reduce its balance of payments deficit. While tighter control of international capital flows was recognized as a legitimate means of accomplishing this desirable goal, it did raise the possibility of added strains on the Canadian economy. Fears that the repatriation of U.S. funds in Canada would adversely affect the economy produced abnormally large sales of Canadian dollars early in 1968; these finally subsided after the U.S. government provided assurances that these funds would not have to leave Canada. This was later followed by a U.S. decision to exempt Canada from its guidelines on direct investment and lending by U.S. banks.

Pluses and minuses in the economy

Two positive forces in particular pushed the economy ahead last year, both in Ontario and in Canada. The first was exports — more specifically, automotive exports to the United States. Directly as a result of the Canada-United States Agreement on Automotive Products — the auto agreement — Canada's to-

¹That is, those countries that did not devalue at the same time.

tal automotive exports almost doubled last year. This represented the third consecutive year of phenomenal increases since the inception of the auto agreement early in 1965. By the end of last year the annual value of auto exports was actually close to 10 times what it had been in 1964, the year before the agreement. Because of these exports – and almost *entirely* because of them – Canada's total merchandise exports (including re-exports) last year soared 10.5 per cent to \$11.41 billion, exceeding the ambitious \$10.25 billion target set for 1967.

The second source of strength last year was Expo. While much of the activity revolving around Expo and Canada's centennial celebrations was centred at the actual Expo site in Montreal, thousands of tourists from all provinces, the United States and overseas took the opportunity to see other parts of Canada. Ontario played host to a large number of them, earning an estimated \$600 million in non-resident tourist revenue as a result. Tourist dollars flowed in all across the country, turning Canada's usually negative balance on tourist account into a positive one in its international balance of payments. Of course tourism affected a number of different industries as well, including retail trade, wholesale trade and transportation, especially during the six months of Expo.

On the minus side there were a number of important developments overshadowing these substantial gains, perhaps the best known being the increase in prices during 1967. For the second successive year price increases were considerably higher than the usual less than two per cent gains of earlier years, although last year's increases were somewhat lower than those of 1966. These increases last year took place despite a general slackening in the growth of total output. Prices rose 3.9 per cent, double the annual gains of the early 1960's, with the largest increases recorded in the government expenditure, service and construction sectors. Government spending during the past two years was indirectly responsible for the increased prices in other sectors of the economy because it created strains in other sectors which led to rising costs and therefore spreading price increases.

But no less important was the poor productivity performance of the economy last year. With manufacturing wages rising rapidly on the one hand and weaker demand producing excess capacity on the other, labour costs per unit of output rose dramatically. For the overall economy weak demand

meant a disappointing rate of growth in real output; and with employment rising more than the volume of output, real output per employee did not increase at all.

Capital investment was another notable area of weakness, although it was not unexpected in the light of the extensive additions to capacity already made in the tremendous investment boom of the three preceding years. Sagging corporate profits, softened markets and a number of industrial disputes had a lot to do with the weakness in non-residential construction and investment in machinery and equipment. On the other hand housing construction, though still hampered by a general shortage of mortgage funds, actually made a substantial recovery in terms of housing starts last year. Mainly because of the introduction of a spring direct-lending program by CMHC, the number of housing starts in Ontario and elsewhere rose sharply in late spring and early summer (though it fell back later in the year), taking total starts just slightly higher than the level reached in 1965. However the full extent of this substantial improvement was not registered in actual investment statistics, mainly because of the very small carryover of dwelling units under construction at the beginning of the year.

The setting for last year

In order to place developments in 1967 in their proper perspective, it is useful to look as far back as the early 1960's when the current economic expansion began. When the economy is viewed in this way, the inevitability of last year's slowdown becomes more apparent. Indeed, at this stage in past business cycles the economy has usually experienced a complete cessation of growth.

It was in March of 1961 that the national economy began to climb upward, following a period of economic stagnation in 1960. At first the high 7.1 per cent unemployment rate and abundant unused industrial capacity made rapid growth a simple matter. Throughout succeeding years, however, the supply of readily available resources diminished rapidly, and in 1965 the economy reached virtual full capacity, its growth limited to gains in productivity and in the size of the labour force.

The first significant signs of strain appeared in 1965 when price increases in the construction sector (resulting from the boom in capital investment) combined with increases elsewhere to exert noticeable inflationary pressures. The price of food – particularly beef

and pork – rose markedly in spring and at year-end mainly because of adverse weather conditions and the cyclical movements in the supply of meat. At the close of the year the government sector also began to exert a powerful influence as expenditures increased sharply.

Though labour costs kept increasing during 1965, they were not as important a contributor to rising prices as were the pressures of demand. This situation began to change early in 1966. It was then that newly introduced Canada and Quebec Pension Plan payroll deductions cut into net take-home pay, adding to the easing in demand for durable goods – particularly automobiles – already evident in the last months of 1965. Fewer hours worked each week in manufacturing, greater payroll deductions led to pressures for compensation in the form of higher wage rates. These pressures, spreading to many areas of the economy, were soon translated into higher wage rates and, accordingly, higher prices. Price increases were most pronounced in the low-productivity service sector, where increases in labour costs far outstripped the very small gains in productivity.

Although goods producing industries, already begun to decelerate at the beginning of 1966, the first quarter saw the largest economic advance of the five year old expansion. Signs of overheating were clearly evident, particularly in all three levels of government spending. The federal government subsequently postponed a variety of capital projects – but continued to operate at a deficit, introducing huge supplementary spending estimates. In order to relieve some of the pressures it brought down new tax measures, including higher personal income tax and a refundable tax on corporate profits so as to curb the investment boom and reduce domestic demand.

What followed, however, was a sudden severe deceleration in the economy, which damped consumer spending and afterward ended the investment boom. Fortunately this exerted an additional – quite powerful – restraining influence on the private goods sector, a sector which had not been responsible for the substantial price increases of previous months. The market for consumer goods substantially weakened, slack developed in manufacturing industries and productivity consequently suffered. This, combined with continually increasing labour costs produced serious erosion of already-stricken corporate profits.

ring 1966 various sectors of the economy began to lose the forward momentum up in previous years. Fixed capital investment levelled off, manufacturing output increased more slowly and the pressures on the tight labour market began to let up a little. Residential construction, already experiencing difficulties because of insufficient financing capital, plummeted in 1966. Yet wages and prices continued to mount, as has been customary at the end of modern expansions.

In spite of this levelling off, interest rates which in earlier months had risen as economic activity soared) remained at very high levels throughout most of the year. Ordinarily such a period of deceleration with its easing of pressures might have meant a return to easier credit conditions. But this was not the case. Despite the marked weaknesses in various sectors of the economy in 1966, several factors were at work leading to tighter rather than easier credit. Probably the most important was the rapid increase in government borrowing. Total government purchases of goods and services jumped 17 per cent in 1966 after experiencing average annual gains of about seven per cent between 1961 and 1965. What expansion there was in the money supply was unable to keep interest rates down throughout most of 1966, as the yield on three-month treasury bills rose to a record-high level of five per cent.

Another important factor was the similar move to higher interest rates in the United States, in this case largely because of the pressures imposed by the drain of resources to

Viet Nam. To retain the ability to attract money from U.S. capital markets it became necessary to raise the rates in Canada whenever interest rates increased across the border.

Conditions in the economy did improve toward the end of the year, though the improvement turned out to be much more temporary than might have been anticipated at the time. During the last quarter there was a modest upsurge in output, primarily because industrial disputes had reduced output and depleted inventories during the preceding quarter. At the same time concern over the tight money situation in autumn led to some easing in credit in both Canada and the United States.

The economy lost momentum at the start of 1967 . . .

Instead of building in strength, the revival at the end of 1966 gave way to further loss of momentum. Additions to inventory made at the close of the year, though significantly lower than they had been earlier in spring, were still excessive in the light of the continued easing in the economy. Early in 1967 shipments levelled off leaving inventories at a relatively high level. This resulted in a sharp cutback in additions to inventory for the first six months of 1967. Though there were large increases in exports, the production of durable manufactured goods, particularly motor vehicles and parts, was reduced substantially at the start of 1967 as the consumer market for durables continued to show some weakness.

In spite of flagging manufacturing production the overall Canadian economy did move ahead at the beginning of 1967, mainly on the strength of large gains in exports. The bulk of these gains, ironically, was in automotive exports to the United States as Canadian producers steadily increased their share of the total North American market.¹

The actual extent of economic growth early in 1967 was somewhat exaggerated by rising prices. In real terms the increase from the last quarter of 1966 to the first quarter of 1967 was little more than one half of one per cent. But a large increase in prices pushed the gain to just under two per cent.

The generally slackened pressures of demand in the latter part of 1966 and early 1967 were responsible for a significant change in financial markets. With the money supply permitted to increase substantially, credit conditions eased and interest rates fell from

their very high levels of 1966. The yield on three-month treasury bills, for instance, fell to four per cent by April, 1967, down a full percentage point from the level of a few months earlier.

. . . substantial improvement in the second quarter

In the second quarter of 1967 real output advanced much more rapidly than it had in the first, while price increases were significantly less pronounced. The commencement of Expo did much to speed up the tempo, as the tourist account pushed exports of services considerably higher. Exports of goods on the other hand barely advanced at all: a poorer performance in lumber, wood pulp, aluminum, nickel, copper and zinc offset gains in other commodities, including newsprint, crude petroleum, natural gas and iron ore.

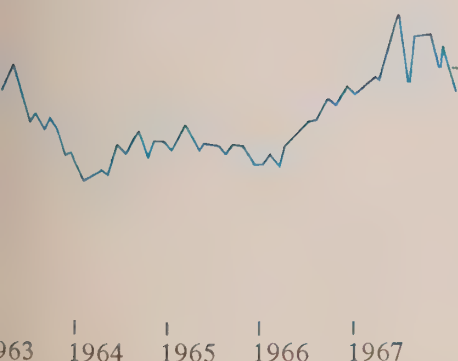
Another source of strength was the improvement in residential construction. After having experienced a decline for a full year, investment in residential construction, encouraged by a new spring program of direct lending by Central Mortgage and Housing Corporation, finally leaped ahead with the largest quarterly increase in years. (This development was particularly strong in Ontario.) However, investment in non-residential construction and machinery and equipment declined, producing an overall decline in total business fixed capital investment. A large increase in government expenditure on goods and services added to the gains in the economy, as did an increase in personal expenditure, spearheaded by increased sales of autos and other durables.

. . . followed by a small decline in the third quarter

In the third quarter the upward trend in the economy was temporarily halted. While gross national product rose 0.5 per cent, all of this gain was attributable to higher prices; in real terms the economy fell back a slight 0.5 per cent.

Declines were evident in a number of areas. There was a rather sharp cutback in government spending on goods and services as well as a continued but now more pronounced drop in the rate of business fixed capital investment. The latter decline once again reflected the unequal pull of opposing movements in the components making up the total: residential construction advanced while the rate of investment in non-residential construction and machinery and equipment de-

Index of Manufacturing Inventories Shipments in Canada



onally Adjusted

¹At the start of the auto agreement private assurances were given that Canadian automotive production would increase a specific minimum amount by the end of the 1968 model year. This virtually guaranteed the continued flow of

vehicles to the United States even when sales were slack.

clined. During this period the advance in residential construction was not as pronounced as it had been in the second quarter; in fact, with the termination of the direct-lending program the number of actual housing starts turned downward.

The moderation in government spending represented the start of a deliberate effort to curb the extremely large increase evident earlier in the year. It was this government spending that had been a leading contributor to earlier price increases.

Exports declined noticeably as well. While the export of services advanced nearly six per cent, the larger merchandise exports component fell eight per cent in the third quarter. Many of the same commodity exports which had declined in the previous quarter continued to fall in the late summer and early autumn, as did wheat, iron ore and scrap iron, newsprint and natural gas. Improvements were made in copper exports and once again in crude petroleum, where exports continued to rise as an aftermath of the Middle East war and the closing of the Suez Canal.

The two increases recorded in the third quarter aside from residential construction were inventory investment and consumer expenditure. Manufacturing production enjoyed a particularly good quarter with durables taking the lion's share of the gain. A major factor was the rise in Canadian automotive production to build up inventories in advance of the announced U.S. Ford strike. But there were other manufacturing gains as well, the two most notable being increased production of electrical apparatus and supplies and rubber products.

... and a small gain at year-end

Recent National Accounts data indicate that there was an improvement in the fourth quarter, but only a very moderate one. While gross national expenditure rose one per cent in current dollars, the real gain was only 0.4 per cent. During this quarter manufacturing production improved, particularly durables, which were enjoying their second successive quarterly gain. Production of primary iron and steel was noticeably higher, spurred by increased foreign sales. Another contributor to this gain in durables was rising production of concrete products, recuperating from the effects of industrial disputes in the related construction industry. Because of the Ford strike in the United States which cut the supply of parts and forced the eventual shutdown of Ford of Canada, total Canadian motor ve-

hicle production in the final quarter advanced only slightly while parts production declined.

Another source of strength was the recovery of merchandise exports following two rather weak quarters. Exports of primary iron and steel and electrical products both advanced, and automotive exports recovered quickly from the strike to make impressive gains toward the end of the year. On the services side, the conclusion of Expo resulted in a sharp reduction in exports of services, but an over 10 per cent gain in merchandise exports left total exports of goods and services three per cent higher in the last quarter.

While consumer spending was not as strong a force in the latter half of 1967 as it had been earlier in the year, it still remained an important contributor to the economic advance in the last quarter.

Less favourable was the progress of residential construction, which for the previous two quarters had been the main force pre-

venting total business capital investment from falling precipitously. Investment in housing declined two per cent in real terms in the last quarter, reflecting the mid-year reduction in the number of housing starts.

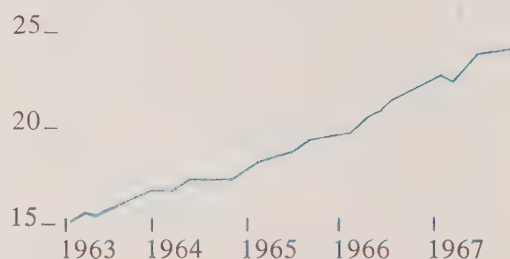
The resumption of non-residential construction work following months of strike eased the declining trend in that area of construction. This was most pronounced in institutional and government construction where earlier some improvement had been noted in the number of building permits issued.

One of the most spectacular developments in the last months of the year occurred in Canada's financial markets. Although interest rates had been climbing from their low point in spring, the first increases — large as they were — were nothing compared to the increases toward the end of 1967. The rate on three-month treasury bills, down to four per cent in April, rose to 4.34 per cent at the end of August, passed the 1966 high point of 5.19 per cent early in November and then soared to just under six per cent by the end of the year. This movement, corresponding to a similar though less pronounced rise in the United States, pushed the treasury bill rate very near the seven per cent mark early in 1968.

There were a number of reasons for this severe tightening of credit. In the United States the use of monetary measures to curb inflationary pressures resulted in rising interest rates, making it necessary for Canadian rates to rise accordingly. In Canada itself governments sought large amounts of cash to cover expenditures while businesses acted to replenish working capital for an expected economic upturn before tight credit conditions returned. Both of these acts in themselves had an immediate effect on credit. They might not have produced quite so startling a change had it not been for a pronounced preference for liquidity on the part of investors. Rather than invest in bonds and mortgages, they sought to retain short-term liquid assets, reducing the resources available for longer-term borrowing. British devaluation late in the year also led to a sharp increase in interest rates in both Canada and the United States. The pressures upon Canada created by the announced program to protect the U.S. balance of payments kept Canadian rates rising as well.

Total Money Supply in Canada

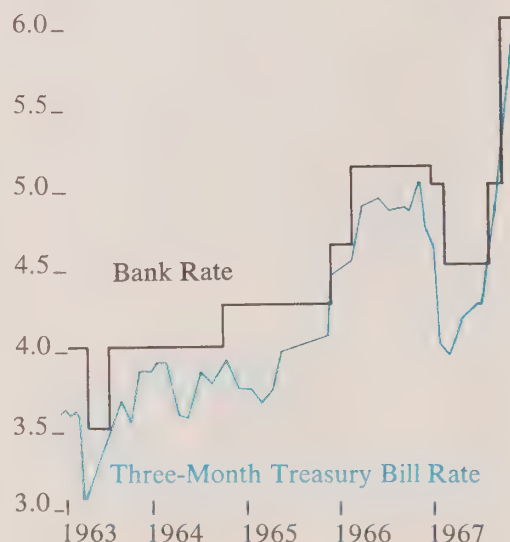
\$ Billion



Seasonally Adjusted

Interest Rates in Canada

%



Oil Output

In 1967 Canada's gross national product experienced the lowest increase in volume of total output since the beginning of the current economic expansion, although this was partially masked by a continued increase in services. Total output of goods and services rose to \$62,068 million in current dollars, an increase of 6.8 per cent over the previous year's \$55,916 million; but the exclusion of the increases – which represented more than one half of this gain – brought the real increase down to 2.8 per cent.

The pattern in Ontario was essentially the same, although the rapid growth of Ontario's automotive industry and the decline in agriculture on the Prairies both contributed to Ontario's relatively better performance. The provincial product rose 7.8 per cent between 1966 and 1967, from \$23.1 billion to \$24.9 billion, but the actual volume of output increased just less than half of this, or

3.7 per cent. As in the case of Canada as a whole this represented the smallest percentage increase in real output since the current expansion began in 1961. In preceding years real growth ranged between 5.6 and 7.6 per cent.

One of the notable aspects of Canada's limited real growth in 1967 was the small advance in the output of goods producing industries. Excluding agricultural output, the output of all goods producing industries rose only 1.9 per cent compared to 8.1 per cent and 7.8 per cent in the corresponding 1965/64 and 1966/65 periods.¹

For the first time since 1960 service producing industries grew more rapidly than goods producing industries, their 4.5 per cent advance being attributable mainly to increased output in transportation, retail trade, and finance, insurance and real estate. Because service producing industries usually experience only small gains in productivity,

the result has been that the overall productivity performance of the economy has not been good.

Putting together the gains in both goods producing and service producing industries, the net result has been a 3.1 per cent increase in the real output of the non-agricultural economy.² This was the lowest gain since 1961, considerably lower than the 6.7 per cent gain recorded in 1966.

As in 1966 the largest gain of all the industry groups was recorded in electric power and gas utilities, which rose 10.0 per cent. In Ontario, the statistics available indicate that Ontario Hydro provided 51.36 billion kilowatt-hours of primary energy, a gain of 6.9 per cent over 1966.

Among the other goods producing industries, the largest advances were in mining and forestry which rose 6.5 per cent and 4.1 per cent respectively. Primarily responsible for the lower overall gain for goods produc-

Manufacturing Production in Canada

	1961	1965	1966	1967	1961 to 1965	1966/65	1967/66
	Volume Index (1949 = 100)				Annual % Change		
Durables	173.6	224.1	240.4	244.9	6.6	7.3	1.9
Food and beverages	159.1	193.1	204.9	213.2	5.0	6.1	4.1
Tobacco and tobacco products	210.0	243.4	258.1	260.8	3.8	6.0	1.0
Textile products	158.6	237.4	258.5	255.3	10.6	8.9	-1.2
Other products	126.9	135.2	137.9	132.1	1.6	2.0	-4.2
Metals	152.1	220.6	233.1	234.8	9.7	5.7	0.7
Machinery	134.8	171.2	179.2	172.0	6.2	4.7	-4.0
Other products	156.7	198.3	216.1	217.7	6.1	9.0	0.7
Printing, publishing and allied industries	180.4	223.3	239.7	249.5	5.5	7.3	4.1
Products of petroleum and coal	274.0	345.9	371.6	387.0	6.0	7.4	4.1
Chemicals and allied products	250.4	344.7	377.5	390.4	8.3	9.5	3.4
Miscellaneous manufactures	292.3	407.3	448.8	461.1	8.6	10.2	2.7
Non-durables	158.9	237.2	255.2	256.1	10.5	7.6	0.4
Food products	144.9	181.7	189.2	187.7	5.8	4.1	-0.8
Iron and steel products	156.6	239.1	253.1	248.4	11.2	5.9	-1.9
Transportation equipment	138.1	250.0	273.8	286.7	16.0	9.5	4.7
Motor vehicles	156.2	347.6	372.3	392.6	22.1	7.1	5.5
Motor vehicle parts	149.1	317.2	345.6	344.3	20.8	9.0	-0.4
Non-ferrous metal products	156.3	186.9	195.7	201.6	4.6	4.7	3.0
Electrical apparatus and supplies	197.9	319.2	368.8	371.5	12.7	15.5	0.7
Non-metallic mineral products	213.2	286.9	296.3	278.0	7.7	3.3	-6.2
Total Manufacturing	166.9	230.1	247.2	250.0	8.4	7.4	1.1

Source: DBS, Index of Industrial Production.

based on indexes of real domestic product less agriculture for Canada (1949 = 100). Real domestic product at factor cost, an elaboration of the supply side of the National Accounts, represents the sum of the unduplicated output of all industries located in Canada.

² The difference between this gain and the 2.8 per cent gain in the constant dollar value of gross national product is accounted for by (i) the exclusion of agriculture (ii) the inclusion of income paid to non-residents (iii) the exclusion of income received from non-residents, and

(iv) the exclusion of "indirect taxes less subsidies." In addition there may be statistical differences between these two measures of aggregate production.

ing industries were poor performances in manufacturing, construction and the relatively minor fishing and trapping category. While manufacturing output increased 1.1 per cent, the failure of capital investment to grow led to a 3.6 per cent decline in the output of construction industries.

In the service producing industries there was less of a spread between the largest and smallest gains experienced by individual industries. At the top of the list was a 5.7 per cent gain in transportation, the major component of the broader transportation, storage and communication group (which advanced 4.9 per cent). Second to this was finance, insurance and real estate, where a gain of 5.5 per cent was recorded. Of the other major groups, public administration and defence as well as community, recreation, business and personal service rose four per cent, while trade advanced 3.5 per cent mainly on the strength of a 4.6 per cent rise in retail trade.

Manufacturing

Softening in the demand for manufactured products was clearly evident last year, in both Ontario and the nation as a whole. In Ontario, the value of manufacturing shipments rose 2.6 per cent to a level of \$19.8 billion, a gain far below the ten per cent increases of recent years. Canada's 2.1 per cent increase followed the same pattern, coming down from 9.2 per cent the year before.

As a result of the better performance in Ontario than in the rest of Canada, Ontario continued to improve its position with respect to total Canadian manufacturing. For a number of years now Ontario has slowly increased its share of total Canadian manufacturing shipments; by 1967 the province's shipments represented 52.9 per cent of Canada's total of \$37.5 billion.

Hardest hit by the general slackening in the economy was the production of manufactured durables. According to the indexes measuring volume increases in manufacturing production, non-durables expanded more rapidly than durables. Of the total 1.1 per cent gain in all manufacturing activity in Canada, non-durables advanced 1.9 per cent while durables rose 0.4 per cent. In recent years of substantial growth, it had been durables which had set the pace, advancing more rapidly than non-durables.

A number of factors were at work contributing to the weakness in durables. First there was the smaller increase in per capita disposable income which affected the demand

for products ranging from television sets to automobiles. There was the slump in construction, an aftermath of the capital investment boom (also in part due to strikes in the construction industry). Iron and steel producers were seriously affected, as output dropped below the level of 1966. Steel ingot production fell from 9,814,000 tons in 1966 to 9,551,000 tons last year, a decline of 2.7 per cent. Hardest hit were manufacturers of non-metallic mineral products, whose building material production reflected the decline in the construction industry.

The motor vehicle industry actually recorded the best gain in manufacturing output, although this represented a lower rate of increase than in previous years, particularly 1965, when gains were quite spectacular. By far the major proportion of the gains could be attributed to the auto agreement; because of it, Canadian automotive exports were maintained at very high levels, even during periods of declining automobile sales in both Canada and the United States.

The number of motor vehicles produced in Canada last year, at 947,000, represented an annual increase of 5.0 per cent. (Passenger car production rose 2.7 per cent to 721,000 units at the same time.) The output of motor vehicle parts, on the other hand, fell just short of the previous year's level.

In the non-durables group, the major advances were in food and beverages, printing and publishing and allied industries and in products of petroleum and coal, all of which expanded just more than four per cent. At the other extreme were declines of similar magnitude in clothing and leather products. Rubber products also declined, but to a lesser degree, mainly as a result of a sharp first quarter decline.

Mining

Recovering from a small decline in 1966, Ontario's mining output soared 24.5 per cent last year, passing the billion dollar mark for the first time. Total mining output rose from \$957.9 million in 1966 to \$1,192.8 million

Ontario Mineral Production

	1966 \$ Million	1967	Volume % Change	Value
Metals	732.4	962.9		31.5
Nickel	269.5	354.9	19.0	31.7
Copper	181.4	256.7	32.9	41.6
Iron ore	91.7	95.2	3.2	3.8
Zinc	24.9	79.0	231.0	217.6
Gold	62.6	56.3	-10.1	-10.0
Uranium (U ₃ O ₈)	42.8	39.2	-7.3	-8.2
Platinum group	32.4	34.3	1.5	5.8
Non-Metallics	23.7	28.7		21.0
Salt	15.7	20.2	21.1	32.8
Fuels	10.2	9.8		-3.9
Natural gas	5.9	5.9	0.1	-0.5
Crude petroleum	4.2	3.9	-2.7	-8.6
Structural Materials	191.6	191.4		-0.1
Sand and gravel	67.2	70.7	4.9	5.1
Cement	52.7	48.1	-16.1	-8.7
Stone	33.6	36.6	-2.6	9.0
Clay products	25.8	24.9		-3.6
Total Minerals	957.9	1,192.8		24.5

Source: Dominion Bureau of Statistics.

1967. Accounting for 28 per cent of Canada's \$4,273.8 million total, Ontario's mining industry enjoyed a larger annual gain than that of any other province, easily surpassing even Alberta's near 18 per cent increase. Smaller increases in other provinces produced a total Canadian increase of 10.7 per cent.

The accompanying table shows the extent of change in the output of various mineral products in Ontario. The influence of price increases is visible in the disparity between increases in the volume and value of certain products.

The value of nickel production was once again the largest of any single metal, as production rose 31.7 per cent from \$269.5 million in 1966 to \$354.9 million in 1967. Copper, the second ranking metal, experienced a 33 per cent gain in volume and a 40 per cent gain in value, rising to \$256.7 million. In comparison iron ore—in third position—almost stood still; it managed a slight rise from \$91.7 million to \$95.2 million, almost totally due to increased volume. The most spectacular gain among the leading metals was recorded in zinc production, where the volume rose from 164.8 million pounds to 545.5 million pounds, and the value more than tripled from \$24.9 million in 1966 to \$79.0 million in 1967. Because of a 10 per cent decline in its production, gold dropped in rank to fifth place. This represented yet another year of decline—the sixth in a row—for the ailing gold industry which has been squeezed by rising costs and a fixed price for gold. Uranium production continued to decline as well, this time by 8.2 per cent. Its value dropped from \$42.8 million in 1966 to \$39.2 million last year.

The overall gain in metals was 31.5 per cent last year, bringing the total value up to \$2,299 million—actually higher than total production of all minerals in 1966. Metals, representing over 80 per cent of the total value of Ontario's mineral production, were a major factor in the overall gain in 1967. Although non-metals rose 21 per cent last year, the fact that they represent less than 20 per cent of total production has meant that this has had only a small impact upon the overall picture. Fuels, even smaller in relative size, declined from \$10.2 million in 1966 to \$9.8 million in 1967, a drop of 3.9 per cent. Structural materials, a significantly larger group than the previous two, recorded a slightly reduced value of \$191.4 million last year. Though sand, gravel and stone rose

somewhat, declines in clay products, cement and lime wiped out these gains.

Agriculture

Agricultural developments last year produced an estimated gross value of farm production of \$1.4 billion, over eight per cent higher than in 1966. Provincial farm cash receipts (excluding supplementary payments other than those paid to dairy producers) reached \$1.28 billion at the same time, up 4.2 per cent from \$1.23 billion in 1966. For the whole of Canada the increase in cash receipts was 3.4 per cent.

Ontario's field crop yields generally held up well in 1967, despite heavy July rainfalls in Western and Central Ontario and below-normal August temperatures in the southern, western and northern regions. Oats, barley, mixed grain, flaxseed, buckwheat and hay crops showed substantial increases over the 1966 yields per acre. However winter wheat, rye, dry beans, soybeans and potatoes showed declining yields.

In terms of total yields, major advances were made in barley, which rose 17.4 per cent from 11.2 million bushels in 1966 to 13.2 million bushels in 1967; mixed grain, up 11.3 per cent from 40.9 million bushels to 45.5 million bushels; and shelled corn, up 11.5 per cent from 64.8 million bushels to 72.3 million bushels. Despite a nearly 11 per cent reduction in oat acreage, oat production was down only 1.2 per cent from 1966. Potato production dropped 26.6 per cent during the same period.

Although Ontario's 210.6 million pound flue-cured tobacco crop was smaller than 1966's 215.0 million pound crop, its quality was exceptionally high, much higher than in the previous year.

Adverse weather conditions in Western Ontario affected fruit production in 1967. In spite of a substantial increase in apple production in Eastern and Northern Ontario, a poor year in Western Ontario produced an overall provincial decline of six per cent. Other fruits were down as well, including plums and prunes, sweet cherries, peaches and pears. Total plums and prunes, down 41 per cent, experienced the sharpest decline. Sour cherries increased approximately 75 per cent from the previous year's rather poor crop. Raspberries, strawberries and grapes were up as well.

Some vegetable crops, including processing tomatoes, sweet table corn, lettuce and bunching onions were somewhat larger than in

1966, while celery, green and wax beans, and radishes were lower. Asparagus showed little change.

Average prices received by farmers for farm products were generally better than in 1966. The estimated total value of fruits increased by about five per cent and that of vegetables by about 10 to 12 per cent.

In livestock, the price of good steers at Toronto increased from a range of about \$24.50 to \$27.50 per hundredweight in 1966 to a range of about \$26.50 to \$29.00. There was a slight decline in the number marketed. Hog prices (dressed, no. 1) dropped from about \$42 to \$33 in the same period; volume increased approximately 17 per cent.

Forest-Based Industries

Because of weakened U.S. demand for pulp and paper and a general slowdown in construction activity in both Canada and the United States, only isolated gains were recorded in the forest-based industries in 1967. Value of production remained close to the level of the previous year, while overall volume was down slightly from the record level of 1966.

Rapidly rising capacity in the newsprint industry and more slowly rising demand—exports to the United States suffered because of increased production in that country—brought about a condition of surplus capacity during the year. Whereas Canadian newsprint capacity utilization was 95 per cent in 1966, last year it declined to 87 per cent. Rated capacity in Ontario, approximately 2,000,000 tons in 1966, rose to more than 2,100,000 tons while output declined from 1,801,000 tons to an estimated 1,740,000 tons. Consumption in Ontario rose 5.5 per cent to an estimated 210,000 tons in 1967. To ease the oversupply situation a number of mills put into effect production cutbacks at various times throughout the year. In response to rising production costs newsprint prices were increased at mid-year by \$3.00 a ton, equal to approximately two per cent of the domestic price and less than the price increase recorded in the previous year.

The value of shipments in the pulp and paper industry, estimated at \$638 million, was up just more than one per cent from 1966. Paper (other than newsprint) and paperboard production rose by 25,000 tons from the 1,275,000 tons recorded in 1966.

Wood pulp production dropped from 3,589,000 tons to 3,559,000 tons over the same period.

Private and Public Investment in Ontario, 1966 and 1967¹

	Construction			Machinery and Equipment			Total Capital Expenditures		
	1966	1967	67/66	1966	1967	67/66	1966	1967	67/66
	\$ Million		% Change	\$ Million		% Change	\$ Million		% Change
Primary industries and construction industry	197.5	176.6	-10.6	308.5	305.1	-1.1	506.0	481.7	-4.8
Manufacturing	389.4	323.8	-16.8	1,030.7	899.9	-12.7	1,420.1	1,223.7	-13.8
Utilities	410.5	377.3	-8.1	425.5	477.7	12.3	836.0	855.0	2.3
Trade, finance and commercial services	280.5	288.5	2.9	270.3	278.0	2.8	550.8	566.5	2.8
Housing	875.5	921.4	5.2	—	—	—	875.5	921.4	5.2
Institutional services and government departments	935.2	1,072.8	14.7	137.8	142.6	3.5	1,073.0	1,215.4	13.3
Total	3,088.6	3,160.4	2.3	2,172.8	2,103.3	-3.2	5,261.4	5,263.7	0.04

¹ 1966 data actual; 1967 preliminary actual.

Source: DBS, *Private and Public Investment in Canada*.

Pulpwood consumption rose only fractionally, from 340 million cubic feet of roundwood in 1966 to an estimated 346 million cubic feet last year. Because of low levels of construction activity, lumber production declined from 773 million board feet in 1966 to an estimated 735 million board feet.

Capital Investment

After three years of very sharp gains, capital spending in Canada fell off last year and virtually stopped expanding. The existence of excess capacity at the end of 1966, the virtual completion of Expo construction and an uncertain business climate all combined to curtail its growth, thereby damping the overall growth in the economy. The value of private and public investment edged from \$15.09 billion in 1966 to \$15.17 billion last year, a scant increase of 0.6 per cent; but the rise in prices alone was far greater than this, indicating an actual decline in real investment.

Ontario's capital investment followed basically the same trend. What had been one of the major engines of growth between 1963 and 1966 was last year one of the major weaknesses in the economy. According to the Dominion Bureau of Statistics, total private and public investment in Ontario remained relatively stable at \$5.26 billion, a little more than one third of the Canadian total. The scant 0.04 per cent gain experienced was made up of a 2.3 per cent rise in construction and a 3.2 per cent decline in investment in machinery and equipment. In actual dollar

terms construction was the larger component, getting six out of every ten dollars invested in Ontario.

Private investment alone was also quite weak across Canada, declining one per cent in current dollars and 3.3 per cent in constant (1957) dollars. Government spending was fairly strong in the first half of 1967 and exerted pressures on prices, but moderated somewhat in the latter half of the year.

Clearly the major weakness in Ontario last year was in manufacturing industries, where a 17 per cent decline in the value of construction combined with a 13 per cent decline in investment in machinery and equipment to produce an overall decline of 14 per cent. Similar declines were recorded in other regions of Canada except the Prairie Provinces where investment in manufacturing rose substantially.

One large manufacturing group, transportation equipment, experienced an 18 per cent decline last year, mainly as an aftermath of the heavy construction activity which came with the start of the Canada-United States auto agreement. Chemicals and chemical products, another large group, also declined; this particular decline of about one third was made up of a 50 per cent drop in construction and a 26 per cent decline in investment in machinery and equipment. Investment in primary metals fell off 18 per cent because of a sharp drop in purchases of machinery and equipment. But construction in that industry rose one third, mainly on the strength of new and expanded production facilities in

areas around Sudbury and Timmins.

Only one manufacturing industry — petroleum and coal products — showed a substantial increase in capital expenditure, rising 1 per cent. The only other group to advance was machinery producers, in this case by 1 per cent. Of the remaining manufacturing industries those showing the largest declines were clothing and knitting mills, producers of chemicals and chemical products, printing and publishing and allied industries, rubber industries and wood industries.

In the broad groups outside of manufacturing there were notably higher capital outlays in institutional services and government departments, as well as smaller increases in housing, trade, finance and commercial services and utilities. Greater expenditures on universities, schools and hospitals were largely responsible for the rise in the first group, while capital outlays by Ontario Hydro of well over \$200 million helped increase investment in utilities.

Primary industries and the construction industry declined nearly five per cent from the previous year.

Another indicator of capital investment — the value of building permits issued — shows that investment intentions in Ontario were no more promising than actual outlays. Despite rising prices, the value of permits for both industrial and commercial construction projects was down substantially from 1966. Industrial permits were valued at \$200 million, a drop of 29 per cent, while commercial permits at \$279 million were 15 per cent

Housing Starts in Selected Ontario Centres

	1965 ¹	1966 ²	1967 ²	1966/65	1967/66
	Number			% Change	
Toronto	32,506	22,155	32,038	-31.8	44.6
Milton	4,519	4,201	5,508	-7.0	31.1
Ottawa-Hull	5,051	4,436	3,708	-12.2	-16.4
Richmond Hill	2,820	2,432	3,198	-13.8	31.5
London	2,466	1,936	2,812	-21.5	45.2
Scarborough	1,308	1,060	1,401	-19.0	32.2
Windsor	1,523	1,365	1,290	-10.4	-5.5
Mississauga	586	504	948	-14.0	88.1
Brampton	309	394	884	27.5	124.4
Chatham	2,164	991	814	-54.2	-17.9
Windsor	565	693	717	22.7	3.5
Niagara Falls	292	399	667	36.6	67.2
Hamilton	613	431	494	-29.7	14.6
St. Catharines	325	414	456	27.4	10.1
Welland	n.a.	287	428	n.a.	49.1
Perth	298	247	400	-17.1	61.9
Kingston	1,203	651	384	-45.9	-41.0
William-Pt. Arthur ³	525	476	376	-9.3	-21.0
Timmins	111	69	69	-37.8	0.0
Urban Ontario ⁴	59,318	45,714	59,761	-22.9	30.7
Total Ontario	66,767	52,355	68,121	-21.6	30.1

¹Data based on 1961 Census Area definitions.

²Data based on 1966 Census Area definitions.

³Centres where number of starts affected by change in Census Area definition.

⁴Total, centres of 10,000 population and over.

Source: CMHC, Canadian Housing Statistics.

over than the previous year. The remaining non-residential category – institutional and government permits – was the only one of the three to rise. Valued at \$513 million, these permits were up 13 per cent from 1966. Attention last year was riveted on housing, where activity represented both a recovery and a continuing problem. The problem was actually a long-standing one, going back to 1966 when the number of housing starts in Ontario – and in Canada – plummeted below the 1965 level. In 1967 there was a marked recovery; but the need for housing remained acute.

The basic problem for several years has been the lack of mortgage funds to finance housing construction, with mounting costs, particularly of land, an added problem. Though this problem existed for a number of years it reached a peak in 1966 when the number of housing starts fell to 52,355 from 66,767 the year before – a drop of 22 per cent. In 1967 the number of starts rose again, but only slightly above the level of

1965. The number of starts reached 68,121 for all areas of Ontario, representing 42 per cent of the Canadian total of 164,123 units.

This nearly one third increase in housing starts is attributable primarily to the efforts made to provide capital. Central Mortgage and Housing introduced a spring program of direct lending and the results were felt immediately; in the second quarter the number of starts soared. This spurt carried over into early summer, but the removal of the stimulus and the absence of a fall program brought about a decline in subsequent months.

The dollar value of private and public investment in housing, after having risen 9.1 per cent in 1966 to a value of \$876 million, due both to the large carryover of house-building begun in 1965 and to rising prices, advanced to \$921 million in 1967, a gain of 5.2 per cent. Essentially, the reason for the lower gain in housing investment in 1967, despite a higher number of starts last year was the absence of a large carryover at the end of 1966. While there were 58,000 units

under construction at the end of 1965, at the end of 1966 the number was only 39,000. By the end of 1967, after construction had picked up for several months in the middle of the year, the number of units under construction had returned to 49,000. Completions in 1967, at slightly more than 58,000, were still substantially less than the 68,000 completions recorded in 1966.

Foreign Trade

Like the year before, 1967 was notable for the impressive performance of exports. Unlike 1966, however, this represented one of only a scant few bright spots in the economy. It was therefore a particularly important factor accounting for much of what growth there was in the Canadian economy.

Even with the strong upward push in exports, Canada's favourable merchandise trade balance narrowed due to the slightly higher rate of expansion in imports. Total merchandise exports (including re-exports) rose to \$11.41 billion in 1967, a gain of 10.5 per cent, while imports climbed 12.3 per cent to a record \$11.08 billion. This reduced the export balance to \$330 million from \$459 million in 1966.

Although the 10.5 per cent increase in exports was considerably lower than it had been a year earlier, the lower overall rate of growth in the economy meant that exports represented a large share of total output in 1967.

Exports proved to be a major driving force in the economy even though wheat exports declined by almost one third. What enabled Canada to reach and surpass its \$11.25 billion export target was the continued spectacular growth of automotive exports, a direct result of the Canada-United States Agreement on Automotive Products. Last year these exports almost doubled. (In the preceding year they nearly tripled.) Since the auto agreement came into effect early in 1965 the impact upon total exports has been phenomenal. In 1964 – the year before the agreement – motor vehicle and parts exports represented a scant 16 per cent of Canada's fully manufactured non-food exports; in 1967 they were over 55 per cent of this total, at a value of \$1.7 billion.

Were it not for automotive exports, the more than 10 per cent increase in domestic exports would instead have been three per cent.

Ontario, which in 1965 accounted for one third of Canada's total exports, has played a

crucial role in the rise in foreign sales. In 1966 Ontario was responsible for one half of the increase in exports; in 1967 Ontario accounted for over 90 per cent of the annual increase, mainly because the bulk of Canada's manufacturing output originates in Ontario.

Large increases in automotive exports have meant large increases in exports to the United States. The growth in exports to the United States was almost double Canada's over 10 per cent rate of increase in total exports. Sales to the United Kingdom advanced 4.1 per cent while exports to all other countries dropped slightly below the level of 1966.

Though automotive exports held the spotlight there were other increases last year. Aircraft exports, a group that fluctuates widely because it is closely related to specific defence arrangements, rose to \$183 million, a gain of 55 per cent. Together with automotive exports these two large groups figured significantly in the 47 per cent increase in exports of inedible end products or fully manufactured non-food products. Crude petroleum and copper and alloys were both about one quarter higher last year while iron ore and concentrates, aluminum including alloys, softwood lumber, and wood pulp and similar pulp were up moderate amounts ranging from four to eight per cent.

The one major export to decline was newsprint which suffered a 1.3 per cent decline. Nevertheless newsprint exports last year, at \$955 million, were second only to the auto-

motive group of exports, after having ranked third behind wheat and motor vehicles and parts in 1966.

Imports last year jumped ahead 12.3 per cent primarily because of a 20 per cent increase in inedible end product imports from the United States. Almost three quarters of Canada's total imports came from the United States; and as in exports, much of this was related to the automotive industry. Out of the \$8.0 billion total value of imports from the United States, \$2.2 billion represented motor vehicles and parts imports. Total imports from the U.S. rose 12.4 per cent in 1967.

Imports from the United Kingdom were affected by that country's dock strike and economic difficulties. A below-average 4.4

per cent increase in our purchases brought the value up to \$673 million. On the other hand, imports from all other countries rose 14.4 per cent to \$2.4 billion, the result of a significant rise in inedible end product imports.

Although the levelling off in capital investment was responsible for an unchanged level of machinery imports, other manufacturing imports rose last year. Among them were aircraft and parts, communications equipment and a variety of personal and household goods. Crude and fabricated materials did not grow to any significant extent, although isolated products like crude petroleum and certain crude non-metallic minerals were somewhat higher.

Total Motor Vehicle and Parts Exports

	1966	1967	1967/66
	\$ Million		% Change
Passenger automobiles and chassis	429.6	879.4	104.7
Other motor vehicles	173.3	326.7	88.5
Motor vehicle engines and parts	137.9	158.9	15.3
Motor vehicle parts, except engine	252.9	365.1	44.4
Total	993.6	1,730.1	74.1

Source: DBS, Summary of Exports.

Canadian Domestic Exports, 1964-1967

	1964	1965	1966	1967	65/64	66/65	67/66
	\$ Million				% Change		
Commodity Group:							
Live animals	34.5	79.1	78.0	42.3	129.3	-1.4	-45.8
Food, feed, beverages and tobacco	1,805.9	1,629.8	1,888.3	1,602.3	-9.7	15.9	-15.1
Inedible crude materials	1,616.1	1,763.7	1,947.6	2,108.3	9.1	10.4	8.2
Inedible fabricated materials	3,502.5	3,728.8	4,012.1	4,229.6	6.5	7.6	5.4
Inedible end products	1,109.0	1,300.1	2,119.3	3,106.8	17.2	63.0	46.6
Special transactions — trade	26.2	23.5	25.3	22.5	-10.2	7.7	-11.2
Geographic Group:							
United States	4,271.1	4,840.5	6,027.7	7,079.4	13.3	24.5	17.4
United Kingdom	1,199.8	1,174.3	1,122.6	1,169.1	-2.1	-4.4	4.1
All others	2,623.4	2,510.3	2,920.3	2,863.4	-4.3	16.3	-2.0
Total	8,094.2	8,525.1	10,070.6	11,111.8	5.3	18.1	10.3

Source: DBS, Summary of Exports.

ence

It was perhaps the most dramatic development between the beginning and end of 1967 took place in capital markets.

Concerned about the declining trend in economic activity in the latter part of 1966, central banks around the world cut their bank rates and moved to increase their money supplies. Following U.S. leadership, central banks of no less than eight countries participated in an 'easy money' policy. Germany, the first to act in early January, was soon followed by other countries, some of which moved on to make two, three and four successive reductions in following months. The United States reduced its rate a second time on April 7 with Canada soon following with a corresponding cut.

An exorbitant demand for money was an unexpected result. Businesses acted to replenish working capital in anticipation of a further demand for goods and services, while governments sought large amounts of cash to cover expenditures. Consequently money rose steadily throughout the year reaching record high levels.

Total new bond financings, with maturities of over two years, totalled \$6,620.2 million in 1967, some 2.2 per cent more than \$6,479.5 million raised in 1966. Of this more than \$2,907.9 million (or 44 per cent of 1967's total) was sold in the final three months of the year. Government of Canada borrowings made up the largest portion of the increased borrowing; whereas Government of Canada medium and long-term borrowings amounted to only \$1,160 million at the first of October, by year-end they totalled \$1,874 million. While the year-end total included the 1967 sale of Canada Savings Bonds, it is significant that no less than \$750 million or 39 per cent of the year's \$1,935 million new Canada bonds¹ came to the market in October and December. The need for government to be especially active in acquiring new funds – \$258 million more in 1967 than in 1966 – reflected a lower-than-expected sale of Canada Savings Bonds as investors turned to more lucrative investments. A substantial portion of the year's borrowing was offered in the form of short-term securities in keeping with the market's tendency to be more receptive to this type of financing during periods of high interest rates. An increase in the demand for funds was the only reason that interest rates climbed this year. Investors were cautious for several reasons: the Carter report on taxation,

Quebec separatist sentiments, Viet Nam, Middle East unrest, sterling devaluation, pressures on the dollar and inflation.

Of these issues, inflation was one of the more important. In 1967 both the Canadian and the U.S. governments moved to curb inflation by proposing tax increases on personal income and urging business to contain price and wage demands. The tax proposals originally came at a time when business economists were voicing the need to stimulate the economy, and thus the proposals – particularly for higher taxes – met with opposition. In the U.S. the increase in taxes was not realized as controversy continued over how much government spending should be cut. The Federal Reserve Board meanwhile moved toward monetary restraint while awaiting fiscal discipline.

In Canada the response was more immediate. The Bank of Canada, following the U.S. Federal Reserve Board's action, pursued tighter money and credit policies. In addition the Canadian Government announced cutbacks in government expenditure and proposed a moderate increase in personal income taxes.

One of the most important developments was the mid-November devaluation of the pound sterling with the subsequent reduction in the currency values of some 18 countries. Investors increased their gold purchases in the weeks following the sterling crisis, and this in turn led to speculation against the U.S. dollar as well. Although there were fears that the devaluation of the pound would exert some pressure on the Canadian dollar, the consensus was that it could be tolerated. This proved to be true. During the year the Canadian dollar had been very strong and was quoted at levels close to the maximum level (US 93¼ cents) permitted under agreement with the International Monetary Fund. Following the devaluation of the pound, the value of the Canadian dollar did ebb for the balance of the year, but only to levels still above its mean value of US 92½ cents.

Inflation affected investors, particularly the large and sophisticated financial institutions, luring them away from fixed income investments in favour of equity commitments. This preference, at the expense of bond market investing, served only to exaggerate the swing towards higher interest rates and placed much more emphasis upon capital appreciation.

Institutional investors showed a distinct preference for equities of U.S. corporations, particularly those listed on the New York and

American stock exchanges. There were two main reasons for this: investors wanted to acquire fast growth issues such as those linked to the space and technology industry, and they had to invest on a large scale. The institutional investor, unlike the individual, invests in an attractive stock only if there is an opportunity to make a substantial investment – and if there is an assured market for the stock should he decide to sell. The degree of marketability in Canadian stocks, except among the best-known issues, is often limited for these investors' purposes.

As a consequence, the number of shares traded on Canada's six exchanges declined to 1.5 billion from 1.7 billion in 1966. The Toronto exchange accounted for 54 per cent of this as well as 68 per cent of the total value. On the other hand, trading activity in the U.S. far exceeded that of any previous year. United States as well as foreign-based institutional investors accounted for a large portion of this volume, turning over their portfolio positions at a very high rate. The attempt to out-perform one another was so intense that institutions were warned on several occasions not to speculate excessively.

The year as a whole, however, turned out surprisingly well with industrial equity prices in both the U.S. and Canada advancing roughly 10 per cent despite the numerous problems in business and in the economy. Prices recovered from the declines of 1966, a year in which investors had sold stocks sharply lower in anticipation of a slowdown. In 1967 this slowdown materialized and the market then looked forward to a recovery.

The Dow-Jones Industrial Index (reflecting NYSE price changes) closed 1967 at 905.11, up 119.42 points from 785.69 at the close of 1966. The Toronto Stock Exchange industrial average closed at 162.28 (based on 1956=100) for a 15.48 point gain on the year. In our domestic markets, Gold and Western Oils closed at particularly higher levels. Golds soared in November as devaluation of the pound stirred speculation about an increase in the price of gold. Oil discoveries in the Rainbow area of Northwestern Alberta raised speculators' hopes, and oil issues rose with them.

Employment

The pressures on the tight labour market, so obvious in recent years, eased somewhat in 1967 as the pace of the economy slowed.

The expanding population of Ontario, including an inflow of 117,000 immigrants from

¹including \$1,485 million of 1967 refunding

other countries, sharply increased the labour force last year. Rising to 2,834,000 from 2,719,000 in 1966, Ontario's labour force expanded by 115,000 – or 4.2 per cent – surpassing 1966's substantial gain of 105,000.

Unfortunately the reduced pace of the economy did not permit complete absorption of the new entrants to the labour force. Employment rose 3.6 per cent to 2,745,000, an increase of 95,000 from the previous year. Consequently the unemployment rate rose from the very low 2.5 per cent level of the two immediately preceding years to 3.1 per cent last year.

In comparison with other areas of Canada, Ontario's employment picture was quite good. While labour force in Ontario rose 4.2 per cent, in all other provinces combined it was up only 3.4 per cent. Employment rose 2.9 per cent outside Ontario, compared with 3.6 per cent in the province. This resulted in a 4.7 per cent unemployment rate in the rest of Canada as opposed to 3.1 per cent in Ontario.

Canada's total labour force thus rose 3.7 per cent to 7,694,000 while employment reached 7,379,000, a gain of 3.2 per cent from the previous year. Nationally the unemployment rate was 4.1 per cent.

Estimates of employees in various major industries in Ontario reveal that the largest increases in employment were recorded in the service sector, particularly finance, insurance and real estate, where the increase ranged around seven per cent. Other service industries advanced at a slightly lower rate, but this was still higher than most goods producing industries. The one goods producing industry to expand significantly – by four per cent – was mining, but this was due to the fact that employment in 1966 was cut sharply because of a strike at the International Nickel Company of Canada. Strikes were important in the construction industry as well, but in this case they affected 1967 statistics and contributed to a less than one per cent increase in the number of employees. Of course the economic deceleration was an important contributor to the small increase as well.

The impact of this deceleration was most keenly felt in the large manufacturing sector last year. Employment there remained steady, with a small increase in non-durables industries slightly outweighing a fractional decline in durables producing industries. In forestry, employment increased less than one per cent.

The greater increase in activity in service industries was responsible for yet another development. Of the 115,000 additional indivi-

duals entering Ontario's labour force, more than one half were males (60,000 as opposed to 55,000 females); but because employment expanded more rapidly in service industries – which employ a larger-than-average proportion of women – more new jobs were filled by females. Of the 95,000 additional jobs filled, 50,000 were filled by women, 45,000 by men.

Income

Unlike many of the other indicators, incomes did not reflect the moderation in economic activity last year, but continued to rise briskly. Personal income in Ontario reached an estimated \$18.5 billion, 9.5 per cent higher than the \$16.9 billion record in 1966. And per capita personal income in the province approached \$2,600, an increase of between six and seven per cent from the \$2,431 recorded in 1966.

The major portion of Ontario's total personal income was accounted for by wages and salaries, which rose to \$12.7 billion last year, up 9.2 per cent from \$11.6 billion the year before. The combined effects of strikes,

wage settlements and varying degrees of activity in the different provinces produced a national gain of 9.4 per cent, with total wages and salaries rising to \$30.8 billion in 1967.

These factors accounted for differences in average weekly wages and salaries as well. In Ontario the largest increases were in forestry, mining and transportation, communications and other utilities, all increasing more than 10 per cent. Gains in other industries ranged between five and seven per cent, with the increase for the industrial composite reaching approximately 6.5 per cent.

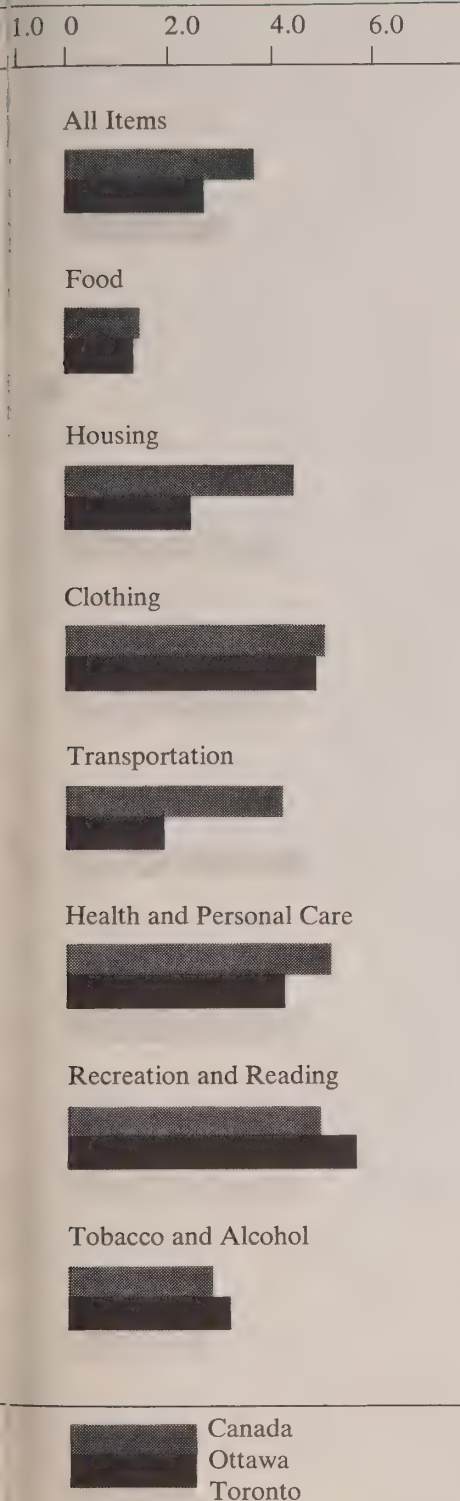
Construction retained its position as the leading industrial group in average weekly wages and salaries, paying an average slightly more than \$132 to the 85,000 employees included in the statistical survey. Mining was close behind at \$128, followed by forestry at \$124. However wages and salaries in other sectors, particularly in the service sector, brought the industrial composite down to approximately \$106 last year.

Changes in Implicit Price Indexes of Gross National Expenditure

	1965/64	1966/65	1967/66
	% Change		
Personal Expenditure	1.9	3.5	3.3
Non-durable goods	1.9	4.1	1.9
Durable goods	-0.3	0.0	2.6
Total goods	1.5	3.2	2.2
food	2.6	6.2	0.1
non-food goods	0.9	1.9	3.3
Services excluding net expenditure abroad	2.9	3.9	5.7
Government Expenditure	5.0	5.9	6.2
Business Gross Fixed Capital Formation	4.3	3.8	2.3
New residential construction	5.0	6.0	7.2
New non-residential construction	6.1	5.4	5.0
New machinery and equipment	2.7	2.1	-1.8
Exports	1.4	3.2	1.7
Imports	0.4	2.0	1.2
Gross National Expenditure	3.0	4.5	3.9

Source: DBS, National Accounts.

Cent Changes of Consumer Price Indexes Canada, Ottawa, and Toronto 1967/1966



Prices

The concern over rising prices which grew from a minor complaint in 1964 to a major worry by 1966 was relieved only slightly in 1967. For the second successive year price increases were fairly large, last year accounting for the major portion of the rise in gross national product.

According to implicit price indexes of gross national expenditure, prices were 3.9 per cent higher in 1967 than in 1966. The corresponding increase one year earlier had been 4.5 per cent, and 3.0 per cent the year before that.

Unlike earlier years when price increases were largely the result of excessive demand, increased prices last year were mainly due to rising costs, in particular rising wages. The largest increases came in the housing, government expenditure and service sector, with gains ranging roughly between six and seven per cent. The accompanying table shows the extent to which these pressures have built up over the past few years. In other areas the pressures subsided somewhat, leaving fairly moderate price increases. Some obvious examples are non-durable goods (especially food) and new machinery and equipment. The smaller increase in export prices was helpful in Canada's constant struggle to remain competitive in world markets.

Looking at the consumer price index, the other important measure of price increases in the economy, the overall increase for all items was 3.5 per cent from 1966 to 1967. The tendency of gains to be concentrated in service items rather than goods was apparent here too as commodity prices rose a modest 2.6 per cent while services soared 5.3 per cent. Clothing was the only major goods item to experience a sharp increase last year.

On a regional basis, the two Ontario centres covered by the survey – Ottawa and Toronto – both experienced smaller price increases than the national average. Both advanced less than three per cent compared with Canada's 3.5 per cent price increase. Only in three specific instances was there a larger increase in either Ottawa or Toronto. In the transportation component increased local fares in Toronto raised that city's gain above the 4.2 per cent national increase. Ottawa surpassed Canada in the recreation and reading component because of an increase in the price of newspapers early in the year; it also edged ahead in the tobacco and alcohol category last year.

Retail Sales

Ontario's retail sales remained reasonably buoyant last year, rising 5.1 per cent to \$8.9 billion. Though this increase did not match the 6.1 per cent gain recorded in 1966, it was nevertheless quite substantial in view of the decline in the market for consumer durables. Moderately higher prices and significant tourist sales undoubtedly contributed to the increase.

Tourism was an important factor increasing sales elsewhere in Canada as well. With Expo and the Pan-American Games attracting large numbers of visitors to Quebec and Manitoba, Canada's overall retail sales rose to \$23.4 billion, 6.0 per cent higher than the previous year.

In Ontario the sharpest increase for the year was in variety store sales, a relatively insignificant group accounting for only three per cent of total sales in the province. This group advanced over 11 per cent.

The performance of the major retail groups varied considerably last year. Sales in grocery and combination stores, which have grown at a fairly steady rate as population has expanded, advanced just over five per cent, almost the same as the year before. Department store sales, increasing at a rising rate throughout most of the year, ended with an annual gain in excess of seven per cent, somewhat better than the 5.7 per cent gain recorded in 1966.

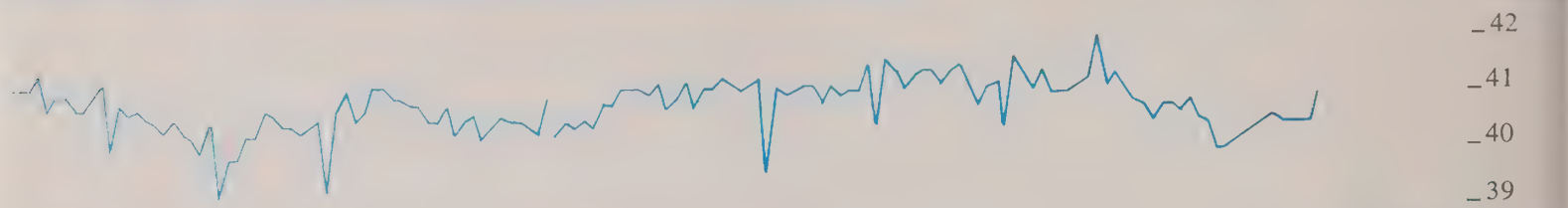
The only category to decline last year was motor vehicle dealers, the second largest group of retailers, accounting for close to 17 cents out of every retail dollar. This group followed up a weak gain in 1966 with an even weaker performance last year, declining by close to one per cent.

Most other groups enjoyed increases of between five and eight per cent, with fuel dealers, hardware stores, service stations and garages and general stores among the leaders. Drug store sales advanced six per cent with shoe stores following close behind. Clothing stores as a group fell just short of the gains enjoyed the year before, rising less than five per cent. The weakness in consumer durables, already evident in motor vehicles, appeared in furniture, television, radio and appliance stores as well; despite a year-end rally they closed the year with a gain of just more than three per cent – a substantial drop from the near 11 per cent gain of 1966.

Selected Economic Indicators

Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Business, Industrial and Engineering Construction Contracts, Ontario



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Leading Indicators

Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
Scale L1
25
20
15
14
13
12
11
10

Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index
1956 =
100
Scale L2
160
140
120
100

Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

--- Current Dollars
--- Constant (1957) Dollars

\$ Billion
Scale L1
60
50
40
30

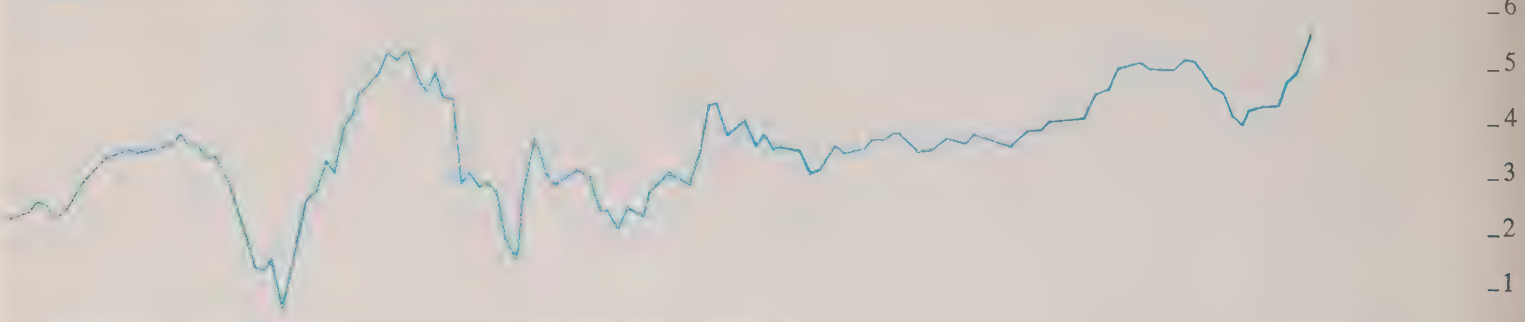
Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

\$
Scale L1
3.00
2.50
2.00

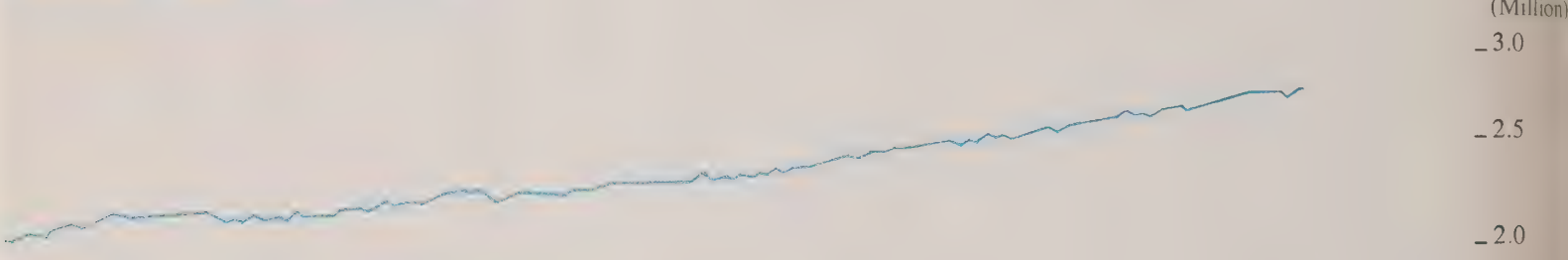
1966 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Coincidental and Lagging Indicators

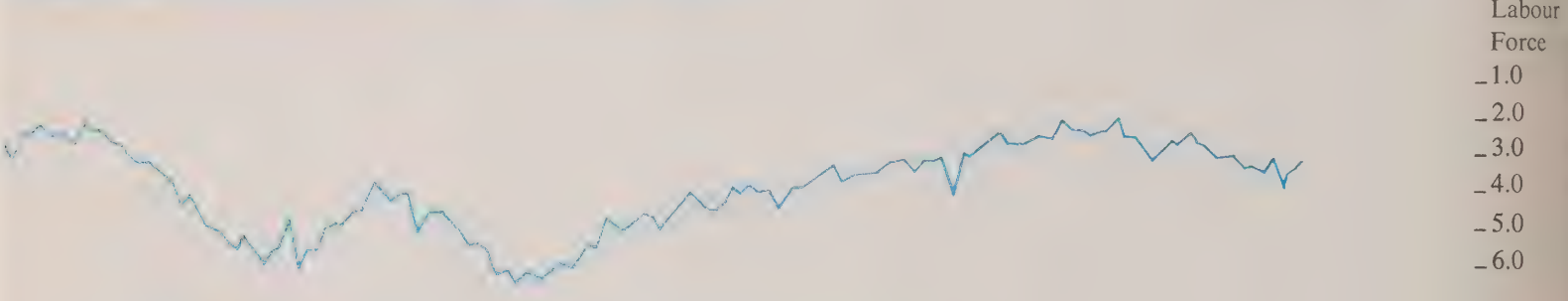
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



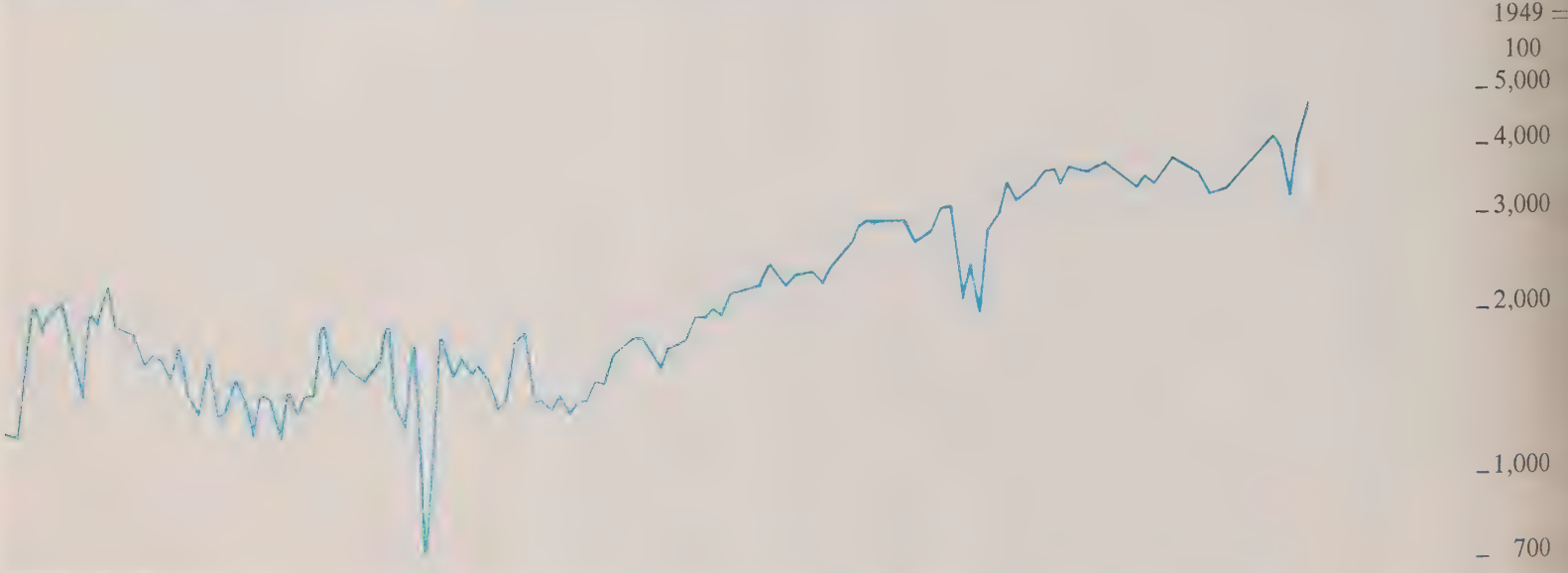
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

ly Adjusted

		1966		1967											
		Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Indicators															
Weekly Hours Worked in															
Manufacturing	Number	40.5	40.4	39.9	39.9	40.1	40.2	40.3	40.4	40.5	40.4	40.4	40.4	40.4	40.9
Orders in Manufacturing Industries ^c	\$ Million	3,125	3,361	3,079	3,038	2,981	3,094	3,024	3,117	3,242	3,107	3,161	3,178	3,118	3,308
Construction, Industrial and Engineering															
Construction Contracts	\$ Million	125.9	179.0	123.8	119.6	138.2	112.9	143.5	129.0	129.3	121.6	99.2	129.7	133.0	125.4
New Starts	Number			49,300	59,100	61,300	62,700	60,100	57,800	48,900	57,500	72,100	66,100	61,000	58,700
Supply ^c	\$ Million	21,149	21,167	21,324	21,869	22,092	22,307	22,522	22,614	22,797	23,191	23,755	23,839	24,041	24,147
Industrial Index ^u	1956 = 100	144.53	147.63	158.21	160.43	165.09	168.28	161.44	164.54	169.66	166.85	168.72	157.39	161.60	162.28
Failures ^u	Number	54	57	71	58	59	73	40	59	52	26	34	79	43	73
Failures – Liabilities ^u	\$ Million	2.7	4.7	4.2	4.0	2.7	2.6	3.3	2.9	3.2	4.1	2.6	16.6	2.9	24.3
Inventory and Lagging Indicators															
National Product ^c (Annual Rate)	\$ Million		58,120			60,836			62,072			62,372			62,992
Hourly Earnings in Manufacturing	\$	2.42	2.41	2.43	2.45	2.46	2.47	2.49	2.51	2.55	2.56	2.56	2.58	2.58	2.60
Treasury Bill Rate ^{c, u}	%	5.15	4.96	4.68	4.58	4.13	4.00	4.24	4.28	4.32	4.34	4.76	4.95	5.46	5.95
Cashed in Clearing Centres ¹	\$ Million	4,795	4,914	5,026	4,931	4,657	5,088	4,964	5,154	5,121	4,983	5,133	5,081	5,459	5,485
Trade	\$ Million	727	720	714	702	711	720	707	761	728	749	773	757	770	761
Force	000's	2,747	2,754	2,774	2,784	2,816	2,830	2,835	2,844	2,862	2,860	2,851	2,853	2,860	2,856
red	000's	2,672	2,687	2,699	2,707	2,729	2,742	2,748	2,750	2,767	2,763	2,762	2,746	2,764	2,762
loyed	000's	75	67	75	77	87	88	87	94	95	97	89	107	96	94
loyed as % of Labour Force	%	2.7	2.4	2.7	2.8	3.1	3.1	3.1	3.3	3.3	3.4	3.1	3.8	3.4	3.3
and Salaries	\$ Million	1,010	1,018	1,022	1,030	1,034	1,045	1,051	1,053	1,064	1,071	1,075	1,070	1,086	1,094
f Industrial Employment	1961 = 100	125.1	125.2	125.9	125.8	125.5	125.3	124.7	124.4	124.9	124.6	124.6	124.4	125.7	125.8
f Industrial Production ^c	1949 = 100	280.6	280.1	278.6	277.7	277.1	280.7	280.0	280.8	283.6	284.6	284.3	282.4	289.4	291.7
I Manufacturing ^c		251.1	250.6	247.7	246.7	246.3	249.7	246.9	247.3	249.0	250.9	251.7	247.5	256.3	257.1
on-Durables ^c		243.5	245.2	242.7	242.4	241.0	244.5	242.7	245.1	243.8	245.0	246.0	246.2	249.0	247.1
urables ^c		260.0	257.0	253.5	251.7	252.5	255.7	251.8	249.9	255.2	257.7	258.3	249.0	264.8	268.9
ng ^c		406.3	404.4	411.1	402.5	401.9	411.4	415.4	424.2	428.4	426.2	421.9	431.2	425.7	440.7
tric Power and Gas Utilities ^c		523.1	525.5	530.8	546.6	541.9	539.1	563.2	555.1	572.9	565.5	555.8	568.0	571.7	572.9
y Energy Demand (Annual Rate)	BKWH	49.91	50.83	49.65	51.25	50.41	50.59	51.86	50.15	51.03	51.80	51.27	52.40	53.80	52.99
s (including re-exports) ^c	\$ Million	896.8	911.4	1,037.9	976.1	897.8	971.0	951.3	962.6	914.5	925.2	861.3	956.7	969.4	1,023.0
s ^c	\$ Million	871.9	873.8	937.9	919.8	850.9	969.5	911.2	893.5	928.6	900.1	921.8	889.5	882.5	928.7
Standardized Indicators															
n Exchange Reserves ^{c, u}	U.S. \$ Million	2,242	2,236	2,238	2,194	2,203	2,188	2,195	2,169	2,183	2,198	2,221	2,303	2,277	2,268
cial Materials Price Index ^{c, u}	1935-39 = 100	255.6	254.7	253.5	253.8	252.2	252.5	254.6	256.7	253.0	252.0	251.2	250.1	252.9	254.3
mer Price Index ^{c, u}	1949 = 100	145.5	145.9	146.0	146.1	146.5	147.8	148.1	148.8	150.2	150.9	150.7	150.5	151.0	151.8

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Ontario Economic Review

Mar/Apr 1968
Volume 6, Number 2

Treasury Department—Finance and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
H. Ian Macdonald, Deputy Minister



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The Ontario Economy

Trade Liberalization and the Forest Industries

H. J. McGonigal, *Economist*
Treasury Department, Finance and Economics

Selected Economic Indicators

A publication of the
Treasury Department –
Finance and Economics
Government of Ontario

Hon. Charles S. MacNaughton
Treasurer of Ontario
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Treasury Department, Finance and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Treasury Department, Finance and Economics, Frost Building, Queen's Park, Toronto 5, Ontario.

About the Review

The feature article for the March-April edition of the *Ontario Economic Review* describes Canadian trade in forest products, and tariff and trade policies which are currently being followed by Canada. Several other trade approaches are considered, in particular, international trade agreements, tariff and non-tariff barriers, and the possibilities for free trade in forest products with the United States, along the lines of the auto pact.

The report reviews a number of factors which will influence the response of Canadian forest-based industries to changing trade conditions. The factors considered include industrial characteristics such as capacity, ownership and structure, and government activities such as industrial assistance programs and anti-dumping legislation.

This paper, an extract from a longer study, was prepared by H. J. McGonigal, Economist with the Economic Planning Branch, Policy Planning Division of the Treasury Department, Finance and Economics. The study was largely completed in the Applied Economics Branch (Resources and Transportation Studies Section) of the Office of the Chief Economist, prior to the recent merger of that office with the Treasury Department.

Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity – commonly used to define business cycles – do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate – because they relate to future rather than present production – are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used – 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) – only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

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In the first quarter of 1968 the economy experienced the same slow growth that has characterized it since early 1966. World-wide monetary strain, unsettled financial markets and severe pressures on the Canadian dollar are considered to be the cause of the slow growth in most sectors. In addition, the tight money policy adopted late in 1967 was further tightened to ward off speculative attacks on the dollar, and fiscal restraint began to exert a dampening effect on the economy through early 1968.

Production

The seasonally adjusted Canadian Industrial Production Index was 286.1 in March based on 1949 = 100. This represents an increase of 0.4 per cent over the February level of 284.9. While this latest movement reversed some of the previous two months, it still left the index lower by 0.5 per cent in the quarter ended in the fourth quarter of 1967.

The March gain originated in both manufacturing – up 0.6 per cent – and mining – up 0.9 per cent. Electric power and gas utilities were up 2.4 per cent. In manufacturing all of the gain was due to a 2.0 per cent increase in non-durables, as durables continued to decline although the drop (1.0 per cent) was substantially less than that for the two previous months. In durables the 2.0 per cent increase in iron and steel products was responsible for almost 60 per cent of the overall production. The major factor in this case was a 10 per cent decrease in the production of primary iron and steel, resulting from a reduction in demand for steel for use in pipes and tanks and in automobiles. In January and February the significant declines in the durable index were largely attributable to labour disputes in both the motor vehicles and the motor vehicle parts industries. The motor vehicle production index in January was 13.0 per cent below the record high for the previous month, and in February 31.0 per cent below the January level. March data indicate a leveling off of the decrease. With the cessation of strikes in this industry a substantial increase in motor vehicle production is expected for April.

In March the mining index returned to 106.6, still below the December 1967 level of 107.7. While the production of gold and copper rose, nickel fell by 4.4 per cent. Increases took place in the production of iron ore, petroleum and natural gas.

The non-durable gain was extensive as production in eight of the eleven major commodities rose. The major contributors to the

advance were textiles, which rose by nearly 11.0 per cent, rubber 18.0 per cent, and food and beverages 2.0 per cent. The only large decline at the major group level occurred in petroleum and coal products.

The 2.4 per cent decline in electric power and gas utilities was entirely due to a 3.0 per cent decrease in electric power. Gas was unchanged. The decline was due to reductions in Ontario and Quebec, particularly in the latter.

Despite the relatively slow pace of both the construction and the manufacturing sectors preliminary March production figures for steel ingots show an 11.7 per cent increase over March 1967. Production for the first quarter stands at 2.7 million tons, a 17.7 per cent increase over the corresponding period in 1967. Cumulative figures for pig iron production showed a 28.7 per cent increase over the similar three-month period in 1967.

Foreign Trade

Canada's exports for the first quarter of 1968 were substantially higher than one year ago according to DBS estimates. Almost the entire three month increase occurred in exports to the United States.

Exports for the month (unadjusted) were recorded at \$987.7 million, 19.3 per cent greater than in March 1967. In the first three months exports totalled \$2.93 billion, up 14.6 per cent from the corresponding quarter in 1967. Imports too were up – at \$902.5 million for March, they were 4.5 per cent higher than March 1967. For the quarter, imports totalled \$2.80 billion dollars. The result was a favourable export balance of \$85.1 million for March and \$127.8 million for the quarter. The export balance for the first three months in 1967 was \$35.7 million.

As in 1967, when annual exports rose 10.3 per cent to \$11.1 billion, the large gains have been unexpected and have resulted from a series of fortuitous, temporary factors.

The 24.8 per cent increase in United States purchases from Canada reflects the effects of the long U.S. copper strike, strikes in the automobile industry in the final quarter of 1967 and stockpiling of steel in anticipation of a U.S. steel strike.

This first quarter advance has moved Canada a long way toward the 1968 export target of \$12.3 billion set by the Department of Trade and Commerce. The target implies a \$1.2 billion rise in shipments from the 1967 value (including re-exports of foreign products) of \$11.1 billion. The \$373 million year to year export gain in the first quarter pro-

vides more than its share towards achieving this goal.

While the trade figures look extremely healthy, the special factor basis of Canada's export performance is evident in the 1967 year-end statistics. Almost all of the \$1.04 billion increase in domestic exports was accounted for by products that benefited from the Canada-U.S. auto agreement, the U.S. non-ferrous metals industry strike, the Middle East war and the war in Vietnam.

Ontario Budget 1968

In his second Budget Statement the Honourable Charles MacNaughton, Treasurer of Ontario, announced a moderately expansionary program with total expenditures and investments exceeding total revenues to produce a net stimulus to overall demand.

Net general expenditures for 1968 are estimated at \$2,780 million, \$489 million higher than the expenditure program for 1967. Loans and advances (excluding advances to Ontario Hydro) will rise by 17 per cent to \$537 million, \$79 million higher than the capital aid program for 1967-68.

Net general revenues will be \$2,528 million comprising \$2,400 million from existing tax rates, \$23 million (surplus) from non-budgetary transactions, and \$105 million from new taxes. Overall financial requirements for 1968-69 will thus be \$252 million.

"Our fiscal policy for next year is balanced between a modest tax increase and a judicious use of our liquid reserves and our credit," the Treasurer said.

"We are encouraging expansion while at the same time maintaining our high credit standing and keeping our finances in good order."

Top priority is given to long-run growth programs: education, aid to local governments, health and housing. In fact increased expenditures on education and aid to local government alone account for 80 per cent of the total budgetary increase of \$489 million. For public investment projects and departmental activities, however, it is a firm, hold-the-line budget.

Tax increases of \$105 million will help keep pace with the growth in expenditures. Tobacco, gasoline, and motor vehicle licence fee increases went into effect March 13. Increases in OMSIP premiums and Ontario hospital insurance become effective July 1. Various departmental user fees will also be raised.

To prevent the ever-widening gap between revenues and expenditures at the provincial-

municipal level, the Treasurer called for a comprehensive tax reform and a major redistribution of taxation fields. "We believe the federal government can well abate up to 60 per cent of the personal income tax and 33 per cent of the corporation income tax while still retaining adequate leverage for fiscal control," he said. The tax fields now available to the provinces are regressive and have no growth potential.

Expenditures

The 1968-69 budget allocates an additional \$201 million for education which is 41 per cent of the budgetary increase this year. In addition, the province is budgeting for some \$350 million in loans and advances to universities, Colleges of Applied Arts and Technology, Ryerson Polytechnical Institute and school boards.

Aid to local government will increase by more than \$191 million which is 39 per cent of the total budgetary increase. The Basic Shelter Tax Exemption recommended by the Ontario Committee on Taxation and adopted immediately will require about \$150 million in the next fiscal year. Takeover of administration of justice costs will add another \$18.5 million.

In health, expenditures will increase on health sciences teaching facilities (including grants for the construction of hospitals) and OMSIP operating expenses. Even with increased premiums, Ontario will have to contribute \$78 million to support the hospital plan and \$37 million to subsidize OMSIP. In housing, Ontario's plans call for a total public program amounting to \$400 million to help meet the need for an average of 90,000 new housing units each year from now until 1970.

In other fields it is almost an austerity budget. The government cut back on capital investment by delaying \$43.5 million of public investment projects. Departmental requests for next year were cut by \$240 million and spending was limited to an increase of 52 million or 6 per cent.

Revenues

The Treasurer's tax increases include:

- A 4 cent increase in tax on cigarettes raising the provincial tax to 6 cents for 20 cigarettes along with changes for other tobaccos.
- A 2 cent increase per gallon in the tax on gasoline and motor vehicle fuel and a 1 cent increase on aviation fuel.
- Increases of \$5 to \$10 in registration fees for cars.

- Effective July 1, 1968, hospital insurance increases to \$5.50 monthly for single persons and \$11.00 for families. OMSIP's premium schedule will be \$5.90, \$11.80 and \$14.75 per month.

As announced in the Treasurer's first Budget Statement in 1967, work is continuing on the improvement of the budgetary process and of the budget presentation itself. This year three supporting Budget Papers were developed to provide a clearer perspective of this year's budgetary policy.

A limited number of copies of the budget are available from: Ontario Budget 1968, Office Services Branch, Treasury Department, Frost Building, Queen's Park, Toronto.

Bank of Canada Annual Report

The Canadian economic situation in 1967 was characterized by a number of cross-currents: a slackening in economic growth was coupled with upward pressures on costs, prices and interest rates.

Louis Rasminsky, Governor of the Bank of Canada, in his annual report to the Minister of Finance said, "We have been paying ourselves increases in incomes which have gone well beyond the amounts we have really earned through increased output, and consequently prices . . . were bound to rise." The Bank believes that monetary and fiscal policy should be supported by other types of policy action to stem the increase in costs and prices.

Monetary policy in 1967 had to compromise between permitting interest rates to shoot up (as a result of enormous demands for funds in capital and credit markets) and accommodating the demand by allowing for increased monetary expansion. In fact Canada experienced both rising interest rates and a rapid rate of monetary expansion until the closing months of 1967.

The year opened with a different trend. Interest rates were facing downward pressures with the evidence of a slowdown in economic growth. The Bank Rate was reduced from 5¼ to 5 per cent, January 30, and was again reduced to 4½ per cent, April 7, 1967.

However in spring several factors emerged to reverse this trend. There were widespread hopes that the adjustment in the North American economy was short-lived and strong expansion would follow, particularly in the U.S. This led to a desire for liquidity to finance the expected expansion. Another factor was the greatly increased government

demand for funds. The Government of Canada's financing requirements in 1966 were \$100 million; in 1967 they rose to \$1,200 million while provincial and municipal requirements (apart from the amount covered by the Canada and Quebec Pension Plans) rose from \$1,600 million in 1966 to about \$1,900 million.

A new feature affecting monetary policy this year was the structural changes in the banking system as a result of the Bank Act revision which went into effect in May 1967. The revisions made banks more competitive by removing or relaxing most of the special restrictions under which banks had been working. Effective May 1, the interest rate ceiling on loans was raised to 7¼ per cent for the remainder of the year and removed altogether as of January 1, 1968. Banks were empowered to originate mortgage loans at current rates of interest and issue debentures (with an original term to maturity of at least five years) which are not subject to cash reserve requirements. The structural changes in the financial system meant that part of the apparent monetary expansion represented the capture by the banks of a larger share of the growth in deposits.

The external conditions affecting monetary policy were the devaluation of sterling in November and the U.S. balance of payment program, outlined January 1, 1968. The sterling devaluation weakened world confidence in the stability of exchange rates and triggered large-scale buying of gold. The U.S. maintained the price of gold at \$35 an ounce with the help of other gold pool countries including Canada which sold the U.S. \$10 million of gold in December alone.

The announcement of the U.S. balance of payments program placed pressure on the Canadian dollar and an abnormal selling of Canadian dollars took place in the exchange market. The Bank Rate, raised from 5 to 7 per cent in November, was further raised to 7 per cent in January 1968. The Bank believes that Canada should not be so dependent on capital imports from the U.S. particularly when the U.S. itself faces a payments problem. Fortunately Canada's current account deficit is decreasing: last year it fell to \$42 million from \$1,140 million in 1966. (Even after discounting Expo tourist receipts, the situation has improved.)

A striking feature of the economic situation in 1967 was the moderate degree of adjustment. The economy continued to expand, though at a slower rate.

I. J. McGonigal, *Economist*

Treasury Department, Finance and Economics

Introduction

The complex and diverse aspects of Canada's and other countries' trade policies are currently of major interest to federal and provincial governments, industrial associations and other private organizations. In the field of forest products the federal government, through the departments of Industry and Trade and Commerce, has undertaken studies of a number of industries in the light of possible trade developments and tariff changes. Industrial groups such as the Canadian Pulp and Paper Association and the Hardwood Veneer and Plywood Association have presented briefs to the federal government on trade policy matters. The Private Planning Association of Canada has studied the impact of trade policies on pulp and paper, furniture and several other industries. In addition, more broadly based studies have been carried out for organizations such as the Economic Council of Canada and the Canadian-American Committee of the Private Planning Associations in Canada and the United States. This report has been developed from the findings of some of these studies and the opinions expressed by industry and government officials and others concerned with the subject of trade policy.

The report provides a general outline of the impact of international trade on the forest-based industries and contains a brief review of changing patterns of trade. National trade policy and its objectives, alternative approaches currently under discussion and the probable results which could follow implementation of different trade policies are also considered.

As the possible re-shaping of trade patterns resulting from tariff revisions depends on many unknown factors, the conclusions must be viewed as probabilities rather than accurate predictions. The available information has been interpreted first in terms of forest-based industries at the national level and then, wherever possible, projected to the level of Ontario's forest-based industries and the opportunities and adjustments which may confront them. Due to its major contribution to export trade, the pulp and paper industry receives the greatest attention. Variations in cost factors between industries and between individual establishments within an industry make the overall assessment of effects of trade and tariff changes highly theoretical. In order to produce more concrete and practical results, cost details of individual firms – both domestic and

foreign – would have to be analysed in the light of changing trade conditions. Therefore this study, while presenting an analysis of certain economic forces influenced by tariff changes, recognizes that their effect in individual situations may vary according to factors such as company structure, capacity, efficiency, product quality, location and market relationships.

INFLUENCE OF CANADIAN AND FOREIGN TRADE POLICIES ON OUR FOREST-BASED INDUSTRIES

Trends in International Trade

The development of new international trading blocs and the expansion of existing regional associations is under active consideration in a number of our foreign markets. In terms of its impact on Canada's current trade patterns, Britain's desire to enter the European Economic Community (EEC) is at present the most important of these developments. Similar applications of other European Free Trade Association (EFTA) members, and the possibilities for enlarged South American¹ and Pacific regional trading associations, are of less immediate concern to Canada although their long-term implications could be serious.

Altered trading alignments and changing marketing conditions will be evident in three areas:

1. The decreasing importance of preferential trading terms within the Commonwealth – a growing trend in recent years.²
2. Additional trade barriers to the growing markets of industrial Europe, especially if other countries come under the common external tariff schedule of the EEC.

3. Continuing dependence on U.S. markets and increasing competition with U.S. producers in both domestic and foreign markets.

These trading developments, coupled with the "Kennedy Round" of GATT negotiations, present Canada with a serious challenge in maintaining its foreign markets and expanding its export trade in a highly competitive international environment.

For 20 years Canada's major foreign market has been the United States. Since 1946 the value of exports to the U.S. has annually exceeded the value of exports to our other major foreign outlet, the United Kingdom. In 1966, 60 per cent of our exports, by value, went to the U.S. with Britain receiving only 11 per cent and every other country receiving a lesser amount. The best short-run opportunity for expanding the market for our products will continue to lie in the close and populous United States, particularly if Britain is admitted to the EEC and our preferential tariff advantages there are eliminated.

Canada's export trade rests to a large extent on wheat and crude and fabricated industrial goods from the mineral and forest products industries. A recognized objective for continued economic growth is to increase the level of manufacturing and the "value added" of our exported goods in the processing and secondary manufacturing industries. This objective will not be easy to achieve against competition from other countries, both at home and abroad, even in industries such as forestry where some natural advantages should favour our operations.

The essence of the problem is Canada's industrial structure. Our manufacturing in-

Geographic Distribution of Canada's Domestic Exports, 1965-66

	1965 Exports		1966 Exports	
	\$ Million	Per Cent	\$ Million	Per Cent
United States	4,840.5	56.8	6,027.7	59.9
United Kingdom	1,174.3	13.8	1,122.6	11.1
European Common Market	625.8	7.3	636.7	6.3
Commonwealth and Preferential (Except U.K.)	502.3	5.9	547.4	5.4
Japan	316.2	3.7	394.2	3.9
Other Countries	1,066.0	12.5	1,342.2	13.3
Total	8,525.1	100.0	10,070.8	100.0

Source: Dominion Bureau of Statistics, Exports by Countries, 1966.

¹Current groupings consist of Latin American Free Trade Association (LAFTA) and Central American Common Market (CACM).

²Particularly since the elimination of duties in January 1967 among EFTA member countries.

Structure of Commodity Trade Exports, 1965, 1966

Major Categories of Commodities	1965		1966	
	\$ Million	Per Cent	\$ Million	Per Cent
Foodstuffs (Mainly Wheat)	1,709.0	20.0	1,966.6	19.5
Crude Materials (Mainly Minerals)	1,763.7	20.7	1,947.4	19.3
(Logs, Poles, Chips, etc.)	(59.3)	(0.7)	(63.1)	(0.6)
Fabricated Materials	3,728.8	43.7	4,012.1	39.8
(Lumber, Wood Manufactures, Pulp, Papers)	(2,033.7)	(23.8)	(2,168.3)	(21.5)
End Products (Mainly Motor Vehicles)	1,323.7	15.5	2,144.6	21.3
Total Exports	8,525.1	100.0	10,070.8	100.0

Source: Dominion Bureau of Statistics, Summary of Exports, 1966.

dustries are generally higher-cost operations, despite lower wage levels, than similar United States industries. This condition is attributed to our tariff-protected industrial sector and to a domestic market not large enough to support the most efficient scale of operations. To compound the problem, foreign tariffs have seriously restricted the access of Canadian products to large foreign markets. To overcome these difficulties new trade policies must be developed which permit Canada to protect and expand its position under the changing conditions of international trade.

Canadian Trade Policy

A basic objective of Canadian trade policy in recent years has been to open larger markets for our competitive industries than our domestic economy can provide. The larger markets are expected to result in greater productivity through large-scale production and specialization in our industries. In addition, through reciprocal reduction of protective barriers, Canadian producers and consumers can enjoy access to imported and, in some instances, domestic goods at a lower cost.

Maximum development of the manufacturing sector is the primary objective of Canadian expansionary trade policies. Since growth in the manufacturing sector produces the greatest benefits in terms of income and employment generation, trade policies should foster trade in manufactured papers and fabricated wood products such as plywood – rather than semi-processed materials such as wood pulp, veneer or rough lumber. In turn, exports of the semi-processed materials are more rewarding than exports of raw materials such as pulp chips or unmanufactured logs.

Many of our semi-manufactured and manufactured products are competitive in international markets and have a greater foreign exchange value than unprocessed material. One dollar's worth of roundwood utilized by our domestic wood-using industries contributes to an output of manufactured goods having more than four times the value of the manufactured logs. In 1963, \$726 million worth of logs, bolts and pulpwood were used by the major wood-using industries in

Value of Production and Consumption of Roundwood and Shipments of Manufactured Goods, Major Wood-Using Industries, 1963

Sources and Users of Roundwood ¹	Value Used	Average Annual Value of Production 1961-1963	Value of Shipments of Manufactured Goods and Roundwood ¹
		\$ Million	
Primary Forest Production		825.5	
Imports			20.1
Exports			32.3
Wood-Using Industries Total	726.4		3,123.6
Pulp and Paper Mills	371.1		1,793.2
Sawmills and Planing Mills	281.1 (est.)		782.6
Veneer and Plywood Mills	67.3		190.9
Other Industries ²	6.9		356.9

¹Roundwood includes logs, bolts and pulpwood.

²Other industries include sash, door and planing mills, hardwood flooring industry, wooden box factories and miscellaneous wood industries.

Source: Dominion Bureau of Statistics.

Canada in manufacturing goods whose shipments were valued at \$3,123 million. Export statistics for 1966 indicate that the equivalent of two million tons of newsprint was exported in the form of pulpwood and chips with a value of \$41,000,000. The equivalent newsprint value would have been about \$260,000,000.

In order to gain more liberal entry to foreign markets for our manufactured products, Canada will have to offer reciprocal reductions in its own protective tariffs. These reductions can best be made in areas where our natural advantages and export potential are greatest.³ These areas include forest industry products.

Canadian Tariffs and Trade in Forest Products

The tariff-protected sector of our forest-based industries includes: producers of the various types of paper – except newsprint and periodical papers; the paper converting industries along with all other secondary manufacturers in the paper trades; and all wood product manufacturers with commodities processed beyond the stage of dressed lumber. Other forest products – logs, pulp chips, wood pulp and newsprint – already enter Canada, th

³Other reductions will also have to be made. The Minister of Finance stated in 1966 at the International Conference on Canada and the Atlantic Community, "I would not want to leave the impression that when I think of industrial sectors in which the major countries should

move toward free trade I am referring only to those in which Canada appears to have a clear competitive advantage over other countries." The Minister mentioned pulp and paper products and mineral products as commodities in which Canada holds a clear advantage.

United States and the United Kingdom free of duty.⁴

Imports of forest products into Canada in 1966 were valued at slightly more than \$169 million, a decline of almost \$100 million from the corresponding value of imports in 1960. The 1966 imports equalled only 7.5 per cent of the total value of Canadian forest products exports in the same year.

Approximately two-thirds of the imports were dutiable, the largest categories being \$62 million worth of papers and paperboards and \$35 million worth of veneer, plywood and other fabricated wood materials. Most imported commodities in 1966 came from the United States; the only exception was in the veneer and plywood category where 56 per cent came from Japan and Taiwan.

Canadian exports of forest products were valued at \$2,244 million in 1966, a 40 per cent increase over 1960. In 1964, the value of exports, \$2,012 million, equalled two-fifths of the total value of shipments of manufactured goods and primary forest products from the forest-based industries. Ontario industries accounted for more than one-quarter of the total value of shipments.

Shipments of commodities entering other countries duty free currently constitute the great bulk of our trade in forest products. In 1966, approximately two-thirds of exported forest products were logs and bolts, pulp chips, wood pulp, newsprint and other duty-free commodities sent to the United States and Great Britain.

In 1965, the value of Canadian forest products exported to the United States was \$1,581 million, or three-quarters of the value of our

Canadian Exports of Forest Products, 1960, 1966

Export Category and Commodity	Value of Exports		Percentage Change
	1960	1966	1960 to 1966
	(\$ Million)		(In Constant Dollars) ¹
			%
Crude Materials			
Pulpwood	25.8	32.6	13.6
Pulp Chips	5.3	8.4	42.4
Other Unmanufactured Wood	56.5	(2)	
Other Crude Wood Materials	(2)	22.2	6.2 ³
Fabricated Materials			
Lumber and Other Sawmill Products	367.3	511.7	23.7
Other Manufactured Wood	8.0	(2)	
Veneer ²		31.8	52.9 ³
Plywood ²		41.5	126.8 ³
Other Wood Fabricated Materials ²		7.4	2.8 ³
Wood Pulp	325.1	520.1	50.4
Newsprint Paper	759.6	972.1	13.0
Book and Writing Paper	12.2	32.9	141.9
Paperboard	12.2	30.9	153.3
Wrapping Paper	5.4	8.2	43.9
Other Papers	5.2	14.9	170.9
Paper Products	4.1	9.0	104.5
Total	1,586.8	2,243.7	26.9

¹Based on changes in Industry Selling Price Indices and General Wholesale Index for selected commodities.

²No comparable figures available due to export commodity classification revisions in 1961.

³Percentage change from 1961 to 1966.

Sources: DBS; Canadian Pulp and Paper Association, Reference Tables.

forest products exports to all countries. Exports from Ontario accounted for \$359 million, or 23 per cent of the total value of exports of these products to the U.S. Almost nine-tenths of Ontario's exports of forest products enter the United States duty free.

A feature common to many Canadian firms in the forest-based industries sector is the production by the same plant of both tariff-protected commodities for our domestic market (i.e. fine papers) and export-oriented commodities such as wood pulp or newsprint. This dichotomy places the firm in the position of favouring free trade or lower tariffs in foreign countries for pulp and newsprint, while at the same time pressing for high protective tariffs in Canada for the firm's other types of papers and paper products. However, the best long-run opportunities for our resource-based firms lie in more liberal trading conditions among the industrial nations.

ALTERNATIVE POLICIES FOR TRADE LIBERALIZATION

The federal government has indicated that it intends to seek free trade with as many countries as possible for many manufactured commodities. To achieve freer trade in forest products we must either reduce or eliminate our protective tariffs and non-tariff barriers

Canadian Imports of Forest Products, 1966

Commodity	Value	Imports From U.S.A.
	\$'000	%
Crude Wood Materials	24,067	99.2
Lumber	38,335	85.7
Veneer, Plywood and Wood Building Boards	23,172	34.0
Other Wood Fabricated Materials	12,539	87.1
Wood Pulp and Similar Pulp	8,904	82.8
Paper and Paperboard	62,035	94.6
Total	169,052	83.8

Source: Dominion Bureau of Statistics.

All forest products from Canada enter the U.K. free of duty under the Commonwealth preference system.

Value of Shipments of Goods Manufactured by Forest-Based Industries, 1964

	Value of Shipments		
	Canada	Ontario	Ontario
	\$ Million		%
Wood Industries	1,395.9	221.0	15.8
Paper and Allied Industries	2,707.3	950.2	35.1
	4,103.2	1,171.2	28.5
Primary Forestry Production	986.9 (est.)	165.0 (est.)	16.7
Total	5,090.1	1,336.2	26.4

Source: Dominion Bureau of Statistics.

to persuade our trading partners to reciprocate. The choice of policies to be followed will depend on two factors: the domestic effects of any policy, and other countries' responses to our trade policy. To achieve complete free trade with a minimum of destabilizing domestic consequences it will be necessary to stage the reduction and elimination of all barriers.

Analysis of alternative trade policies in this study is mainly limited to their effects on the domestic environment. The international aspects require a separate study outside the scope of this report.

Tariff Reductions

A basic step in any policy for trade liberalization is the reduction of tariffs against imported goods. In the past, reductions in Canada's protective tariffs have generally been opposed by our domestic manufacturers. The Canadian-American Committee

of the Private Planning Associations of the U.S. and Canada, in its support for an Atlantic free trade area approach, offered the following criticism of the GATT negotiations for multilateral tariff reductions:

Partial reductions in other nations' tariffs do no more than decrease the competitive disadvantage of Canadian goods moving abroad. On the other hand, the corresponding acts in Canadian protection facilitate penetration of the domestic market by already lower-priced foreign goods. There appears insufficient incentive in such partial tariff cuts for a full restructuring of Canadian industry.⁵

Trade liberalization will require the relaxation of non-tariff barriers too. In the view of many Canadian exporters, other countries' non-tariff barriers are "cumbersome, costly and obscure and act as a brake on trade—very often they counteract the effects of even far-reaching tariff reductions . . ."⁶ The sub-

ject of non-tariff barriers is highly complex. The more "simple" and negotiable barriers include quota systems, automatic anti-dumping laws, discriminatory valuation of imports and documentation procedures. The complex barriers include discriminatory standards, quality, discriminatory shipping rates and regulations, and other provisions such as governmental purchasing preferences which favour domestic rather than foreign services and products. The federal government recently made a commitment to GATT to establish new, less restrictive anti-dumping regulations covering imports to Canada. Other non-tariff trade barriers may also have to be relaxed to win reciprocal advantages in foreign markets.

Area and Commodity Trade Agreements

Policies for free trade can be separated into two categories: the area or geographic approach—regional and world-wide trade agreements; and the commodity approach—sectoral and blanket trade agreements. Regional agreements can cover both multilateral and bilateral policies, as within an Atlantic association of countries (multilateral), or an agreement with the U.S. alone (bilateral). Within the geographic framework, alternatives exist in the various types of commodity agreements and include general or blanket agreements covering all commodities, or more limited agreements covering fewer commodities. The limited commodity agreements may be established on a sectoral basis to cover the products of one industry.

Prime Minister Pearson, in an address to the International Chamber of Commerce Congress in May 1967, stated:

There is a growing appreciation that certain whole sectors or industries must be approached on a broad international front . . . By dealing with these industries as a whole, it may be possible to negotiate balanced bargains covering both tariff and non-tariff barriers.⁷

The description of the type of industry I was referring to is certainly appropriate for some sectors of the forest-based industry that are characterized by high capital investment, advanced technology, large-scale production and widely dispersed international operations.

One limited form of free trade for Canadian commodities may be achieved through regional trade agreements. A regional agreement might include the United States and the EFTA countries as the nucleus of a free trade area. Some type of Atlantic Free Trade

Ontario and Canadian Exports of Forest Products to U.S., 1965

Commodity Group	Ontario Exports	Total Canadian Exports	Ontario Percentage
	\$'000		
Crude Wood Materials	9,326.7	30,358.5	30.7
Sawmill Products	23,119.0	377,570.8	6.1
Veneer and Plywood	15,344.8	35,386.1	43.4
Other Fabricated Wood Materials	1,673.6	4,408.7	38.0
Wood Pulp	93,709.8	371,427.9	25.0
Newsprint and Other Printing Papers	209,462.4	748,432.2	28.0
Other Papers	6,015.5	13,317.8	45.2
Total	358,651.8	1,580,902.0	22.7

Source: Dominion Bureau of Statistics.

⁵"A New Trade Strategy for Canada and the U.S.," Atlantic Community Quarterly, Summer 1966.

⁶Canadian Electrical Manufacturers Association, Non-tariff Barriers to Trade and Competitive Disadvantages in Foreign Markets, April 1967.

⁷"The Next Steps in Trade Liberalization," Atlantic Community Quarterly, Summer 1967.

Area has been advocated in recent years and is being seriously studied by the Private Planning Association of Canada. The federal government has stated its disinterest with restricted membership agreements as they would tend to act as additional barriers to expanding world-wide trade with countries outside the regional bloc. In 1966, Prime Minister Pearson stated that:

"Discriminatory, inward-looking regional groupings . . . are no answer to the problems of the world today. Whether formed on a European or North American or even an Atlantic basis. Unless such groups are so organized as to look outward, as to lead to wider arrangements . . . they can be a step backward rather than forward."⁸

As an example, the EEC will adopt common tariffs against goods from all non-member countries on July 1, 1968. The external tariff system of the EEC is threatening to affect imports to the EEC member countries whose own tariffs were initially lower than the forthcoming common tariff rates. GATT membership, on the other hand, is available to any country and the results of GATT negotiations are available to all member countries on the Most Favoured Nation basis.

Bilateral Arrangements

A more restricted regional agreement would be a bilateral trade agreement between Canada and the United States. In recent years the possibilities for various free trade arrangements between Canada and the U.S. have become a popular subject for discussion. Two trade arrangements are under scrutiny: first, complete, or almost complete, free trade; and second, limited free trade in selected commodities only, as in a sectoral agreement.

The elimination of tariff and other protective barriers could be negotiated under three different arrangements: (1) a free trade area system; (2) a customs union; and (3) a common market. In each of these systems protective trade restrictions between the member countries - Canada and the U.S. - could be eliminated on almost all commodities.

The systems differ primarily in their degree of mutual action on trade relations with non-member countries. Each offers the elimination of trade restrictions among member countries. In a "free trade area," each member country can maintain its own external tariffs with outside countries. In a customs union the member countries would

establish a common external tariff against outside countries. The "common market" arrangement represents a much greater degree of integration among member countries both in trade policies and in other spheres.

The forest-based industries have favoured a free trade arrangement that would also encompass the European countries rather than an agreement with the United States alone. In the larger grouping, our producers would have to face not only the competition of efficient U.S. producers but also the competition of the generally less-efficient European manufacturers. European producers, particularly in the U.K. and EEC countries, must rely to an increasing extent on imported raw materials in order to meet growing demands; however, in the past they have strongly opposed tariff reductions on pulp and papers because of fear of North American competition.

In political terms, Canada would appear to have more independence in an Atlantic or Hemispheric Association, than in any type of association with the United States alone. An American Free Trade area, which would also include Caribbean and Central American countries, has also been proposed. However, due to the relatively undeveloped state of the other countries, it would not differ significantly from a bilateral agreement with the United States. There is vigorous public opposition to any general free trade agreement with the U.S.

A Canada-U.S. arrangement that could get more public support is that of free trade in particular products only. Limited bilateral free trade agreements such as the auto pact are more acceptable to Canada than the more complete forms of economic integration because the degree of independence forfeited is, in theory, greatly lessened. However, other GATT members might react unfavourably toward further bilateral agreements for individual industries beyond the current Canada-United States auto trade agreement. In addition, the position of the United States industries and government on further bilateral agreements is uncertain.

A sectoral free trade agreement could cover the products of the forest-based industries. Free trade between the two countries already exists in many raw and semi-processed forest products - roundwood, pulp chips, semi-finished lumber, wood pulp, newsprint and waste papers.

Canadian forest products manufacturers have criticized the limited, single-industry

free trade approach since inputs such as imported U.S. mill machinery would still be dutiable. The industry claims such a disadvantage would make it difficult for our producers to achieve competitive production costs.

Manufacturers also believe that a single-industry approach would not provide enough incentive to the federal government to alter its anti-combines legislation. They say that mergers and industry-wide planning would be necessary to deal successfully with a lessening of protection here and in the U.S. Without some relaxation of current anti-combines legislation in Canada, such activities could be illegal.

A brief from the Canadian Electrical Manufacturers Association to the Economic Council of Canada⁹ urges more flexible anti-combines legislation to enable those manufacturers facing reduced tariff protection to improve their competitive strength. The electrical manufacturers contend that changes in world economic conditions could be relied upon to preserve competition in the Canadian domestic market.

The various policy alternatives open to the government are not mutually exclusive. Rather they can each be considered as progressive stages toward a distant objective of complete and universal free trade in forest products. After the current round of GATT reductions are implemented, opportunities and necessities may well force Canada to consider further tariff reductions. However, the unwelcome prospect of reciprocal trade restrictions and increased barriers still exists. It appears likely that progress toward free trade in Canadian forest products will occur as a result of further reductions in tariffs and non-tariff barriers through sectoral free trade agreements on a regional or multinational basis.

FREE TRADE IN FOREST PRODUCTS BETWEEN CANADA AND THE UNITED STATES

Canada's Forest-Based Industries and the Auto Pact

Obvious differences between the auto industry and the forest-based industries make it difficult to appraise the applicability of a Canada-U.S. trade agreement strictly patterned on the auto pact. In the words of Mr. Drury "the automotive program was devised to meet a unique set of circumstances and, as such, is not directly applicable to other industries."¹⁰

⁸From an address by Prime Minister Pearson to the Atlantic Economic Community, November 1966.

⁹Submission to the Economic Council of Canada on "Certain Important Aspects of the Responsibilities of the Registrar General of Canada," July 1967.

¹⁰"Canadian Commercial Policy on Perspective": An address by C. M. Drury, Minister of Industry, to World Trade Conference, 96th Annual Meeting, C.M.A., Toronto, May 29, 1967.

The Canadian auto industry is comprised of a few large firms, subsidiaries of U.S. parent companies. Their products are similar and have been advertised jointly in the U.S. and Canada for many years. The Canadian industry supports a number of small domestic industrial suppliers who are highly susceptible to the repercussions of the trade agreement.

The forest-based industries are a large group of separate and distinct industries producing a great variety of products. Their common feature is the use of forest products as raw materials. The industries considered in this section are those primary and secondary manufacturers whose products are industrial goods manufactured from raw or semi-processed forest products. The pulp and paper industry leads the group in terms of value of shipments, although the wood industries – sawmills, veneer and plywood mills, sash, door and planing mills, casket makers and others – represent a much greater number of individual establishments. While there were 131 primary pulp and paper establishments in Canada in 1964, there were more than 5,000 individual firms in the woods industries.

In the last decade there has been a trend toward enlargement through integration within the forest-based industries. The smaller pulp and paper mills and sawmills are often marginal operations incapable of high volume, high quality production. The future prospects for such firms are poor regardless of possible developments in Canadian and United States trade agreements. In the last two years, six small groundwood pulp mills located in Eastern Canada have had to heavily curtail production or shut down entirely. In Ontario, Domtar Ltd. announced that it will close its St. Catharines sulphite mill early in 1968.¹¹

The federal government recognized when the auto pact was being developed that eliminating U.S. tariffs would not be sufficient to remove the institutional impediments to automotive trade. Since these impediments, resulting from U.S. ownership, could also limit domestic production and exports, Canadian auto manufacturers were committed to greatly expand their production and maintain the Canadian content of their production over the period of the initial agreement to 1968. The current agreement is thus, in effect, a conditional free trade agreement.

Impediments related directly to U.S. ownership of Canadian firms are less significant

in our forest-based industries than in the auto industry, since a considerable number of firms in this group are not controlled by U.S. corporations (even in the pulp and paper sector where U.S. participation in Canadian production facilities is high). As an unavoidable corollary, conditional clauses guaranteeing our firms a share of the growth of the U.S. – or Canadian – market would certainly not be offered by U.S. firms in a forest-product free trade pact. Unfortunately, the U.S. marketing system can cause formidable difficulties for the independent Canadian pulp and paper producers. There are only a few open marketing outlets serving U.S. consumers of papers. Most U.S. outlets and converters are producer-controlled and are tied to one company's products. The result is that Canadian mills that are not affiliated with U.S. corporations have difficulty obtaining large-scale marketing outlets and customers among the paper converters in the United States.

In order to realistically judge the possibilities for a free trade agreement for our forest-based industries each member in the group must be considered individually. Each of the major categories of manufactured products from paper to plywood, is unique in production methods, costs and end uses. As opposed to autos, the commodities are low-unit-value items, mass produced in numerous different grades, dimensions and species, for a variety of firms for further manufacturing into other industrial or consumer goods. The consumer market does not provide a large direct outlet for the products. A similar industrial structure exists in the United States where mergers, consolidations and integration have been even more prominent than in Canada.

Results of a Free Trade Agreement

Some continental reorganization of production facilities based on raw material supplies and markets could be expected to result from a free trade agreement. The larger U.S. producers could replace some of our smaller, less efficient producers. However, the converse would also be true with Canadian firms dominating in some of the sectors. Under duty-free entry Canadian newsprint manufacturers have held a strong position in the U.S. market for many years. Our producers should continue to do well in the future, despite the rapid growth of a domestic industry in the southern states. It is the overall result of the relative efficiencies of the various

Canadian and American producers by which a free trade agreement in forest products must be judged.

The industry has stated that sales taxes and duties on inputs will leave our producers at a disadvantage compared to U.S. competitors. The new Canadian tariff rates on machinery will average out to nine per cent.¹²

It is interesting to note that in 1966 U.S. machinery manufacturers unsuccessfully urged their government to raise tariffs on foreign pulp-and-paper-making machinery (European) to the previous level of 25 per cent from the current level of 7.5 per cent. New Kennedy Round rates will range from 3.5 to 5 per cent for most machinery entering the United States – still considerably below the new Canadian rate.

In the auto parts industry, despite lower average wage rates in the Canadian industry and the dollar discount, average costs for our manufacturers are estimated at 5 to 15 per cent higher than in the United States.¹³ In more general terms, it is believed that "many Canadian industries have higher production costs than comparable U.S. enterprises, even though manufacturing wages average 17 per cent below U.S. rates."¹⁴

In the forest-based industries there are similar cost disadvantages, particularly for smaller producers, but the disadvantages are often less severe due to lower raw material costs. The gap in productivity between Canada and the United States is much smaller in the forestry sector than in other areas of manufacturing and could probably be effectively eliminated for some of our operations.¹⁵

Under a free trade pact raw material (logs) could move in much greater volume to the most efficient neighbouring U.S. manufacturers for processing – provided transportation costs made this traffic economical. However most provinces restrict the export of logs. Ontario's legislation governing exports is The Crown Timber Act which states that all timber cut has to be used for manufacturing in Canada, unless used for fuel, building, etc.¹⁶ The restriction applies only to timber cut from public lands. No restriction is placed on the export of timber cut from patented lands, but a statutory declaration¹⁷ must be made which states that the forest products to be exported were cut from patented lands.

Interprovincial shipments of raw material to our most efficient mills might also increase unless restricted by provincial authorities. Quebec legislation concerning Crown Timber

¹¹The Financial Post, Toronto, July 15, 1967 and September 2, 1967.

¹²Free entry for machinery not available in Canada and a 15 per cent tariff on machines which are or could be manufactured here.

¹³Paul and R. J. Wonnacott, "The Automotive

Agreement," Canadian Journal of Economics and Political Science, May 1967.

¹⁴"Canada-U.S. Trade Relations," World Business, March 1967.

¹⁵Economic Council of Canada, "Scale and Specialization in Manufacturing," Fourth

Annual Review, ch. 6 (Ottawa: Queen's Printer 1967).

¹⁶Revised Statutes of Ontario 1960, The Crown Timber Act, Sec. 14, ch. 83 as amended by 1961-62, ch. 27.

¹⁷The Crown Timber Act, Sec. 15, op. cit.

covers the movement of logs across the provincial boundaries as well as across the Canadian border.

As a result of the increase in domestic production of cars and parts following the auto pact, the suppliers of raw materials and industrial goods for the auto industry have an expanded market. If Canadian forest-based industries' production were increased substantially, some secondary expansion would occur in supporting services and equipment. However, the impact of increased production would be greatest on the immediate supply of standing timber and the actual timber harvesting operations. Increases in the scale of logging operations could generate some increase in the demand for woods labour – which is already becoming scarce – and modern mechanized logging equipment. If any great expansion of industrial production and raw material consumption occurs without similar increases in current expenditures for future timber production and forest land management, shortages of material could result.

FACTORS AFFECTING THE RESPONSE OF THE FOREST-BASED INDUSTRY TO NEW TRADE CONDITIONS

Capacity

The existing productive capacity of the forest-based industries in Canada is sufficient to support a considerable increase in exports.

Annual Investment in the Forest-Based Industries, Canada, 1960 to 1967

Capital and Repair Expenditures

Sector	1960	1963	1964	1965	1966 ^(pa)	1967 ⁽ⁱ⁾
	\$ Million					
Forestry	97	106	145	151	141	141
Wood Industries	87	94	110	132	115	100
Paper and Allied Industries	267	326	454	565	719	617
Total	451	526	709	848	975	858

(pa) preliminary actual

(i) intentions

Source: Canada, Department of Trade and Commerce, "Private and Public Investment in Canada," annual.

Up to the end of the third quarter of 1967 there was increasing surplus capacity in the various sectors of the pulp and paper industry due to a current slowdown in growth of demand and a large increase in capital investment. Actual production as a percentage of productive capacity was 91 per cent for paperboards, 88 per cent for newsprint, 88 per cent for other papers and 85 per cent for chemical pulps.¹⁸

Primary forestry activities showed a significant increase in investment and repair expenditures from 1963 to 1964, thereafter holding relatively constant up to the present. Annual expenditures in the wood industries

showed a gain of 32 per cent from 1960 to 1966.

The major increases in capital investments in the industry began in 1963 when investment was more than 10 per cent higher than the level in 1962. Capital and repair expenditures continued to increase substantially each year up to 1966. Investment intentions for 1967, as determined in March of that year, indicate a decrease from the previous year's expenditures for the first time this decade. Early indications suggest that 1968 expenditures will again continue downward as productive capacity has exceeded demand in the short run.

Pulp and Paper: Production, Capacity and Consumption in Canada

Commodity	Annual Production		Annual Capacity		Increase in Annual Capacity 1960 to 1966	Consumption Per Capita 1966	Increase in Consumption 1960 to 1966
	1966	1967 ¹	1966	1967			
	(thousands of tons)				%	(lbs.)	%
Newsprint	8,419	8,123	8,878	9,336	16.6	65.8	23.9
Paperboard	1,674 ^e	1,560	1,662	1,715	43.0	147.2	25.6
Book and Writing Paper	587 ^e	717	745	763	73.7	46.7	33.8
Wrapping Paper	424 ^e	447	404	533	49.3	39.2	19.5
					(1960-67)		
Issue and Sanitary Paper	202 ^e	260	255	265	58.4	21.9	32.7
Wood Pulp	16,004	15,504	17,108	18,158	30.2	—	—
Total Paper and Paperboard	—	—	—	—	—	359.5	24.0

^e estimate

¹ 1967 production figures are based on production to September 30, 1967, as reported in the monthly statistical bulletin, C.P.P.A.
Source: Canadian Pulp and Paper Association, Reference Tables, July 1967.

¹⁸ "The Pulp and Paper Industry" monthly statistical bulletin of the C.P.P.A.

The outcome of the great increase in investment expenditures in the pulp and paper industry has been a comparable rise in productive capacity and actual production for most sectors of the industry. The basic capacity of the industry, in terms of annual capacity for wood pulp production, has increased 38.2 per cent from 1960 to 1967. The increase in capacity for book and writing papers was the highest – 73.7 per cent from 1960 to 1966. Newsprint capacity showed the least increase – only 16.6 per cent from 1960 to 1966. It appears that relatively little of the investment expenditures were for the purpose of increasing newsprint capacity. Wrapping paper capacity had increased by only 13.2 per cent from 1960 to 1966; however, a major increase in 1967 has raised capacity by more than 25 per cent in that one year alone. The international character of the Canadian pulp and paper industry has undoubtedly contributed to its spectacular growth in this decade.

On the basis of current domestic per-capita consumption, the Canadian market could absorb only a portion of the maximum output realizable by the different industry sectors. The investment in productive capacity of the industry has been predicated on continuing world demand for papers and paper products. In order to take advantage of the projected growth of foreign markets, emphasis must be placed on encouraging exports.

Ownership

Variations in the degree of foreign ownership among Canadian industries will have a marked influence on the responses of the industries to changes in trade policy. The management of foreign-owned operations in Canada must be influenced by the economic situation of both the parent operation and the conditions in Canada. In addition, when tariffs are reduced multilaterally, a U.S.-owned subsidiary in Canada might find itself competing with products of its U.S. parent concern. The same situation will apply, of course, to Canadian-owned subsidiaries in the United States. The response taken by the subsidiary – or imposed on it – is most significant to this study.¹⁹

The alternatives open to the parent firm range from closing the subsidiary, where production and distribution costs favour the parent operation, to integrating the subsidiary into a branch plant system. In the branch plant organization each establishment could specialize in the most profitable product lines, or continue duplicating production, as before the reduction in tariff protection. The latter

approach would be chosen when economies of scale are insufficient to overcome regional production advantages related to marketing, transportation and distribution costs or other special considerations. The most likely alternative in many instances would be some combination of specialization and regional production which makes use of the existing investment in subsidiary plant. Problems of rationalization, specialization or plant location will be analysed differently by firms that are national in operation from those that have establishments in several countries. International firms have a wider range of alternatives.

In the forest-based industries in Canada there is significant foreign investment and control, particularly among the larger firms. By 1964, non-residents owned long-term investments valued at \$1,703 million²⁰ in the wood and paper manufacturing industries – an increase of \$158 million from 1963 to 1964 alone, and of \$388 million from 1960 to 1964. The majority of these capital inputs have been in the form of direct investments in branches, subsidiaries and controlled companies. The biggest source of funds is the United States.

More than 40 per cent of total investment in the Canadian pulp and paper industry is U.S. owned. Although the degree of foreign ownership in the wood industries is considerably less, here too between 80 and 90 dollars of every \$100 of foreign-owned investment come from the U.S. In 1962, an estimated 20 to 25 per cent of the total assets of the wood industries was controlled by non-residents (on the basis of assets of corporations which are more than 50 per cent non-resident owned).²¹

In recent years there has been some additional influx of capital from Scandinavian countries, several western European countries, Japan and even India. At the same time, Canadian firms have been seeking American, British and other foreign affiliations and subsidiaries, at least partly for the purposes of

forward integration in production and marketing operations.

R. M. Fowler, President of the Canadian Pulp and Paper Association, highlighting the international aspects of ownership and trade said pulp and paper production was moving into the hands of large international corporations and

“if we want rapid expansion of Canadian trade to meet rapidly rising world demand this is the way it will be done; . . . growth based on Canadian efforts alone will be much slower. At the same time, Canadian companies will need to invest extensively in manufacturing and merchandising facilities in developed countries and in new industries in the less developed countries.”²²

Structure

Historically, our tariff protection has supported the development of domestic producers with a structure suited to the limited Canadian market. As a result of such protection, our paper industry has developed a structure capable of supplying many grades, in short runs, to meet the needs of a small population. A similar situation exists in many other countries, each supporting their own domestic producers. Exports of protected grades of paper from Canadian producers have seldom accounted for more than one-tenth of total production and most exported volume has gone to Commonwealth countries where preferential tariffs exist. In contrast, 93 per cent of the tonnage of newsprint produced in Canada in 1965 was exported.

In order to respond to changing patterns and lower tariffs, our forest-based industries will require restructuring and reorganization. Greater specialization of production in commodities where our producers have the greatest competitive advantages must be emphasized. Within Canada, rationalization can also include geographical concentration of production to take advantage of economies

Ownership of the Canadian Pulp and Paper Industry,¹ 1963

	Percentage Ownership of Total Investment			
	Canada	U.S.	U.K.	Other Countries
Pulp and Paper Industry	48	44	7	1
All Manufacturing	46	44	8	2

¹DBS, Canadian Balance of International Payments, 1963, 1965.

¹⁹For a detailed study of the operations of subsidiary companies in Canada, see “Foreign-Owned Subsidiaries in Canada,” Department of Trade and Commerce, 1967.

²⁰DBS, Canadian Balance of International Payments, 1963, 64, 65.

²¹See “Corporations and Labour Returns Act: Report for 1962,” Department of Trade and Commerce, 1965.

²²From an address by R. M. Fowler to the Annual Luncheon of the Canadian Pulp and Paper Association, January 1967.

related to raw materials supply, transportation, distribution and marketing advantages. Restructuring will require further capital investments in new or converted plants. Production facilities will have to be capable of achieving maximum economies through large-scale production. In the pulp and paper industry this will mean concentrating production in long-run, large-volume, competitive grades of paper for domestic and foreign markets. It is evident that the necessary rationalization of our forest-based industries will require time, assistance and a degree of industry-wide planning and cooperation which is currently unknown and may even be legal, under our combines laws.

When the structural changes needed for survival in an international market are viewed jointly with the existing ownership patterns of the forest-based industries, one important observation can be made: specialized production can be achieved more easily by internationally based operations than by wholly Canadian establishments.

Most international firms should be in a favourable position to alter their structure in terms of geographic and productive efficiencies. Domestic firms, on the other hand, will become dependent on a reduced number of commodities in which they will specialize by virtue of their comparative advantages. Studies of the pulp and paper industry in Canada suggest that freer trade with the U.S. will favour branch plant operations by the international firms, in contrast to wholly or partially owned subsidiary operations. The duplicate production functions of the subsidiary plant were more suited to the old tariff-protected, self-contained Canadian market.

Restructuring our forest-based industries will require more than a rationalization of production facilities alone. Further integration seems necessary throughout the industries. Increased access by Canadian operations to organizations and outlets in United States and other foreign markets can be expected. An ownership interest in a foreign operation will help overcome institutional and non-tariff barriers to increased trade.

Activities aimed at forward integration and the purchase of foreign firms have been taking place in the Canadian pulp and paper industry. In 1967 a number of mergers and acquisitions were effected. Following the union of the Consolidated Paper and Bathurst Paper Companies, the new organization obtained control of two U.S.-based firms, a

paper converter (Orchids Paper Products Company) and a manufacturer of tissues (Doeskin Products Ltd.). An interest has also been acquired in a British Columbia lumber wholesaling firm (Cooper-Widman Ltd.). The Abitibi Paper Company announced the purchase of an eastern Canada fine paper distributor (Intercity Papers Ltd.).²³ A French industrial combine (Cellulose du Pin of France) acquired an interest in Donohue Bros. Ltd., a Quebec-based newsprint producer. This transatlantic connection is reported to have resulted in a contract for the annual sale of 5,000 to 10,000 tons of newsprint in the French market. MacMillan Bloedel Ltd. is planning to expand its logging activities in tropical areas. The company has acquired an interest in an enterprise which holds cutting rights to 100,000 acres on the island of Bougainville, east of New Guinea. Several other companies are also seeking similar opportunities in Europe and the United States.

Without greater international integration our independent, or non-U.S. affiliated, producers will face marketing handicaps in the U.S. and consumer ignorance about our "foreign" products, grades and specifications. U.S. producers will not face the same degree of unfamiliarity because of the great overflow of U.S. advertising coverage into Canada. Canadian producers will have to make substantial investments in order to gain distributor acceptance for their trade marks and grades. Our firms will also have to provide the range of products and services expected by U.S. and other foreign consumers.

The foreign marketing problems which will be faced by Canadian producers indicate that rationalization through mergers of the smaller firms into financially strong, integrated units is often appropriate. Another approach to the foreign marketing problem is the establishment of an export consortium.

In 1960, an amendment to the Combines Investigation Act was instituted to protect companies which formed a consortium for export purposes from prosecution under the Act. The amendment requires that cooperation in the export market be insulated from behaviour in the domestic market. A consortium acts as a common sales agency for all member companies. The advantages of a common export sales agency include lower costs of transportation and marketing through large-scale operations, better sales coverage and lower costs for the individual member. The consortium can offer the foreign buyer a

wider range of products and larger quantities than would be available from a single company. A consortium would also have a better credit standing for financing sales than an individual firm. The greatest obstacle in operating a successful consortium lies in achieving a mutually acceptable allocation of sales among competing member firms.

Two forest industry groups operating as export consortia are Quebec-based Canexco and Seaboard Lumber Sales operating from British Columbia. Canexco comprises 20 companies exporting softwood lumber and pulpwood to western Europe. Seaboard Lumber Sales represents a number of western lumber producers in European markets.

Anti-Dumping Restrictions

Current anti-dumping regulations ensure that producers in Canada and the United States will offer their products in the other country at prices not lower than their own domestic market prices. In Canada, anti-dumping penalties apply if an item is priced below its home market price. In the U.S., an imported good sold below its home market price must injure local manufacturers before anti-dumping penalties are applied. A new, less protective anti-dumping code similar to that of the United States has been accepted by Canada in the Kennedy Round negotiations and is to be effective no later than July 1968.

Some Canadian pulp and paper manufacturers have contended that U.S. anti-dumping regulations are a serious barrier to increased paper exports – under current price differentials.²⁴ Although the actual application of American anti-dumping regulations to the protected paper grades has not been widespread, its effect has been to discourage exports of Canadian papers and boards, apart from the prevailing rate of duty. In order to compete in the U.S. markets, prices of many exported papers will have to be lowered. Unless domestic prices are also reduced to the export price level, U.S. anti-dumping duties could be imposed. A reduction in U.S. tariffs can be of no practical value to Canadian manufacturers with higher domestic prices, because of the anti-dumping prohibition on selling in the U.S. at American prices. On the other hand, the Canadian anti-dumping regulations do not exclude the less costly U.S. goods.

With the forthcoming reductions in our own protective tariffs, Canadian producers will be forced by import competition to lower their domestic prices to a level somewhat

²³See also the acquisition early in 1968 of Cox Newsprint Inc. of Augusta, Georgia, a southern U.S. newsprint producer, by Abitibi.

²⁴See also CEMA report, Non-tariff Barriers to Trade, 1967.

closer to U.S. market prices. The necessity for our producers to compete in the new continental market, coupled with the threat of anti-dumping penalties, will be a strong inducement for the establishment of parity prices in North America for many forest products.

Government Assistance to Industry

The federal government is expected to provide some assistance to firms to adjust to new trading conditions. In January 1966, the President of the C.P.P.A. stated that in the event of major reductions and exposure to U.S. competition "the adoption of a policy of adjustment assistance is an essential first step to enlist active and understanding support (of the domestic industry) for the reduction of trade barriers and to stimulate the industrial changes needed to compete actively in world markets."

The industry feels an assistance program should be flexible so that the specific problems of each establishment may be dealt with effectively. The need for assistance will vary from one mill to another, depending on size, type of production, opportunities within the company to engage in alternative types of production and the availability of alternative employment for workers in the area.

The system used by the EEC for the exposed industries of member countries provides assistance to those industries to help them re-establish in other lines or in different locations. The system includes cash compensation for the dislocation of factories and "trade adjustment allowances" for plants closed as a result of the tariff cuts among members.

The details of assistance programs being planned by the federal government are not yet available.²⁵ Trade officials are planning extensive consultations with industries and trade associations on anti-dumping legislation. Similar consultations have already been held in several cities to outline Canada's tariff concessions in the Kennedy Round and the new export opportunities available as a result of other countries' tariff reductions.

A model assistance program exists in the Auto Industry Adjustment Assistance Board, set up to help companies and workers affected by the auto pact. In order to encourage more efficient operations in the domestic auto parts industry the government has made provisions for loans at six per cent interest to help parts manufacturers expand production; assistance is also available to workers displaced through

adjustments in the auto industry. Similar forms of transitional assistance encouraging adjustment and rationalization for the newly exposed industries such as paper converters could be instituted by the federal government.

Government spokesmen have suggested that capital, in the form of loans rather than grants, might be made available to companies whose business is seriously injured by the tariff reductions. An agency such as the Canada Development Corporation could be used in a role similar to that of the Auto Industry Adjustment Assistance Board and could act as a large-scale lending agency. The government has also indicated that there will be more emphasis on research and development to maintain and improve Canada's long-term trade prospects. The need for specific measures of assistance beyond the provision of a cheap source of capital is uncertain at this stage.

Disruptions to Canadian manufacturing firms, including the forest product manufacturers, will not occur suddenly, as tariff changes will be phased over some years. The new anti-dumping code for Canada will have more immediate impact on the manufacturing industries than the more gradual scheduling of tariff changes here and in other countries.

Various incentive schemes to encourage Canadian exports could be established by the federal and provincial governments. Some form of direct assistance, such as export subsidies to manufacturers, would be disallowed under GATT regulations. Other government activities, such as the provision of export credit services, export insurance and trade promotions, acceptable under GATT, are already available to Canadian exporters. Tax relief, such as accelerated depreciation allowances and remission of sales and other "overhead" taxes on export goods, is another area where export incentives can be provided.²⁶ In the light of the Kennedy Round results, both the Ontario and the federal governments, are currently emphasizing their established programs for trade promotion and export credit and insurance services. The expansion of these programs can be particularly useful to the forest-based industries.

Addendum

The Kennedy Round Adjustment Assistance Program for Secondary Industry

In a speech to the Canadian Manufacturers Association on January 31, 1968 (reported in *Industrial Canada*, March 1968), the Honourable C. M. Drury said:

The (Adjustment Assistance) program's chief features will be the offer by the Government of insurance of the major share of the risk on industrial assistance loans by private lenders; direct Government loans in cases of defined hardship; and technical assistance to manufacturers in preparing adjustment proposals for the purpose of improving their production, managerial, marketing and financial operations.

The program will be administered by a Board to be established under the Department of Industry Act. The services of the Department of Industry and its various branches will be made fully available to the Board and to eligible firms seeking assistance. The fullest possible use will be made of the experience gained from the automotive Adjustment Assistance Program.

(The program) has two principal objectives: first, and most important, to derive as much benefit as possible from the widening markets and increasing scope for specialization and longer production runs; second, to assist firms which are adversely affected to adapt to more competitive conditions.

Summary and Conclusions

Important changes in trading conditions are taking place in the major foreign markets for Canadian forest products. As a result of the elimination in January 1967 of internal tariffs among the EFTA member countries, Canada's preferential trade position in the U.K. market has been effectively reduced and Canadian forest products exports face increased competition in Britain. In addition Britain's application for membership in the EEC would, if successful, probably result in the complete elimination of the Commonwealth preferential tariff rates now offered to the U.K.

The major western European exporters of paper and board products are Finland and Sweden. Both countries are members of EFTA and are reported to be seeking EEC membership. Because of their lower transportation costs, forest products from Finland and Sweden have advantages over most North American commodities in the British and continental European markets. If the Nordic countries gain free access to the EEC market through membership in the Community, their export opportunities throughout Europe will only be limited by the eventual shortages of additional domestic timber supplies.

The greatest short-term rate of expansion of demand for forest products is expected to occur in the European and Japanese markets.

²⁵Not available at time of writing. The Minister of Industry has since revealed an adjustment assistance program which is to include a loan fund of \$10 million for the first year. (See addendum.)

²⁶For an analysis of the effects of tax structures on international trade see "Border Tax Adjustments" in the OECD Observer, No. 30, October 1967.

Britain and Germany are now the major European importers of paper and board products. Unfortunately, the tariff reductions offered by the EEC in the Kennedy Round, have not substantially opened up that market for many Canadian forest products. The tariff-free quota of 1.9 million metric tons has been retained by the EEC for wood pulp exports. The newsprint tariff rate, applicable after reaching a tariff-free quota of 625,000 metric tons, has not been reduced.

Although the actual enlargement of the EEC to include Britain, Sweden or Finland is unlikely in the near future, the Canadian government must continue to work for greater trade opportunities with the Community. The potential market in the EEC for Canada's forest products is important both in itself and as a counterbalance to our singular dependence on the U.S. market. For Canadian firms interested in improving their access to the EEC market, the vigorous development of affiliations with European companies would be valuable. The nationalistic outlook of France and the current European disfavour with the extent of U.S. acquisitions of European firms might provide the independent Canadian companies with an advantage over their U.S. competitors.

In the more immediate future, our industries will be influenced by the Kennedy Round tariff reductions which will be implemented over the next five years by Canada and the United States. It appears that the general influence of these tariff adjustments will be an overall increase in trade with the U.S. There may be a tendency toward parity prices in the new continental market for our previously protected forest products. Some slight lowering of the producers' domestic prices may occur due to increased U.S. competition and in order to take advantage of opportunities in the American market without fear of U.S. anti-dumping penalties. In addition, prices of manufacturing inputs such as production machinery should be somewhat lower as a result of tariff reductions on these commodities. There should be some further specialization by the forest products manufacturers in their most internationally competitive product lines, particularly for papers and other secondary manufacturing operations. In line with this specialization, outlets in the U.S. will be increasingly important for the Canadian forest products manufacturers.

Another important aspect of a move toward continental rationalization of production will be the response of U.S.-owned subsidiaries in Canada. A recent Economic Council of Canada survey of future investment plans of a sample of companies in Canada reports:

Particular uneasiness was expressed by a number of subsidiaries of foreign companies. Under lower Canadian tariffs, such foreign companies it was feared, might find it advantageous to build larger plants outside of Canada to supply the Canadian market as well as their home market, rather than to establish or expand manufacturing facilities in Canada.²⁷

Because Canada has large raw material supplies, the exclusive development of sites outside of Canada is not a serious possibility for the primary sectors of the forest-based industries. It is, nevertheless, a possibility which will have to be kept in mind for some of the secondary manufacturing establishments. The solution to this potential problem could become more important if the two countries move further toward bilateral free trade in forest products.

It appears that the federal government will next attempt to achieve trade liberalization in forest products and some other industrial sectors on a broad regional basis. A regional grouping which would be favoured by Canada for sectoral trade agreements would encompass the United States, the EEC and EFTA countries, and any others who wished to join. Public opposition to a Canada-U.S. free trade area approach, and the serious problems related to industrial structure, ownership and market characteristics will probably delay for some years the development of a limited, bilateral forest products free trade agreement. Further specialization, rationalization and efficiency of production – developments which will be encouraged by the tariff reductions – must be achieved by the protected sectors of the forest-based industries before a limited bilateral agreement can be rewarding.

Apart from sectoral free trade for forest and mineral products throughout the world, some other policies for trade liberalization are also being advanced by Canada. With the final implementation of the new Kennedy Round tariff rates, non-tariff barriers will be the most important obstacle to access to for-

foreign markets. Reducing these barriers on a world-wide scale is a long-range objective.

Another objective of the federal government is the expansion of trade between the developed and developing nations. World-wide free trade in tropical products has been proposed by former Trade Minister Robert Winters. If the proposal is accepted by other countries, it might produce some additional competition in the future for our own forest-based industries. Extractive industries based on forest resources are a potentially important sector of the economy in many tropical countries. However, on economic grounds alone the merits of encouraging these developing markets outweigh any minor negative aspects of the policy.

The government's future trade policies must continue to have as their objective "the balanced growth of the Canadian economy."²⁸ The objective can be achieved through the expansion of an efficient manufacturing sector, including the secondary industries. Canada's trade policies, as they affect the forest products trade, must be bolstered by government encouragement to industry.

The manufacturers themselves will also have to put forth maximum effort to achieve efficiency of production, to successfully penetrate foreign markets and to face increased competition in their home market. A stronger marketing effort will be required in the U.S. and other countries, perhaps through export consortia.

The relatively long period and the gradual implementation of the new tariff rates will provide time for government and industry to recognize and plan the treatment of any emerging problems. In order to gain sufficient warning, close contact with the affected sectors of the forest-based industries will have to be maintained over the implementation period.

This report has been prepared before the actual application of the new tariff rates and, in that sense, is a preliminary analysis. Continuation of studies of the effects of changing trade policies on the forest-based industries is very essential, as the consequences of the tariffs and shifting trading patterns become clearer. The eventual adjustments and opportunities facing Ontario's forest-based industries will have a significant effect on the total economy and on the forestry-oriented northern regions in particular.

²⁷As reported in *The Globe and Mail, Toronto*, December 5, 1967.

²⁸The address by Finance Minister Mitchell Sharp to *The Annual General Meeting of the Canadian Manufacturers Association, Toronto*, May 29, 1967.

Selected Economic Indicators

Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)

Number
Scale A



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

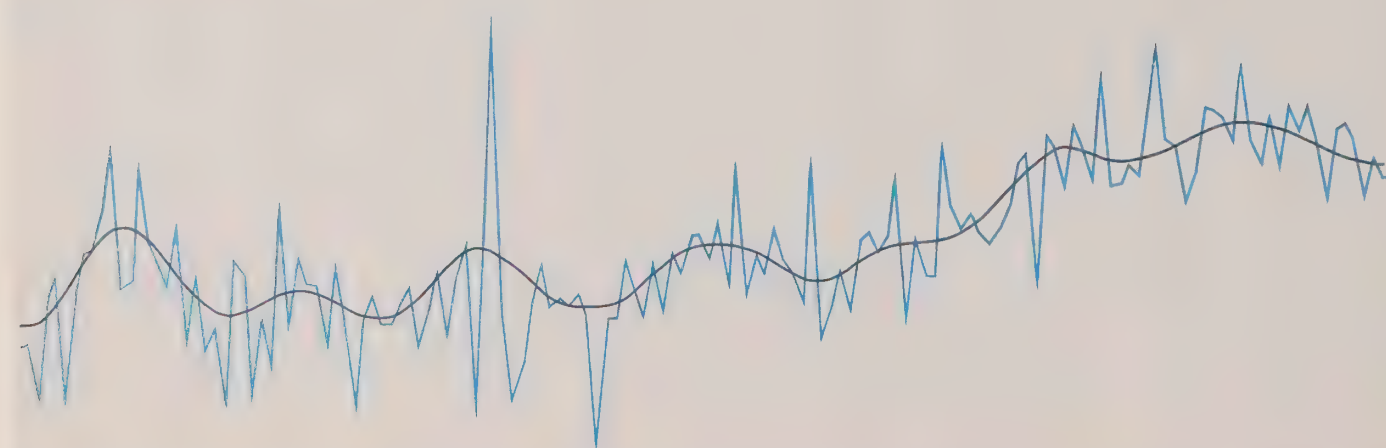
\$ Billion
Scale L1



Business, Industrial and Engineering Construction Contracts, Ontario

— Trend Cycle
— Seasonally Adjusted

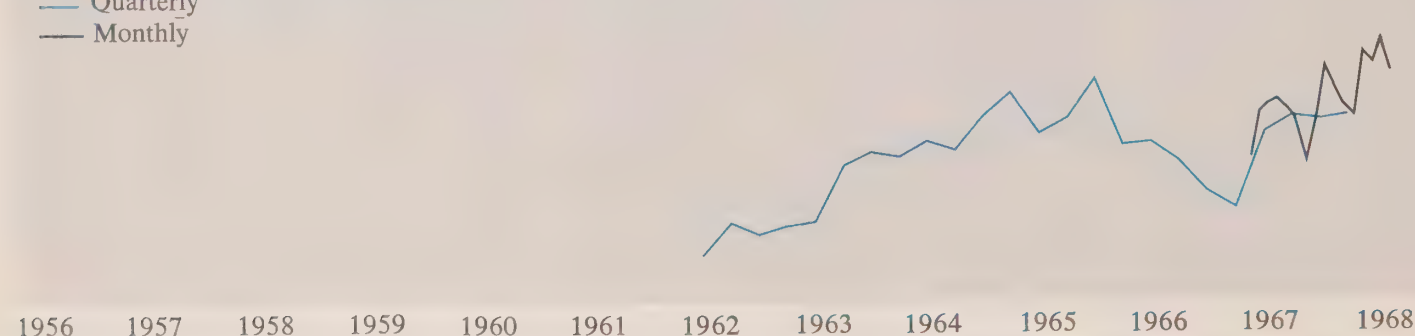
\$ Million



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

— Quarterly
— Monthly

Thousand



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

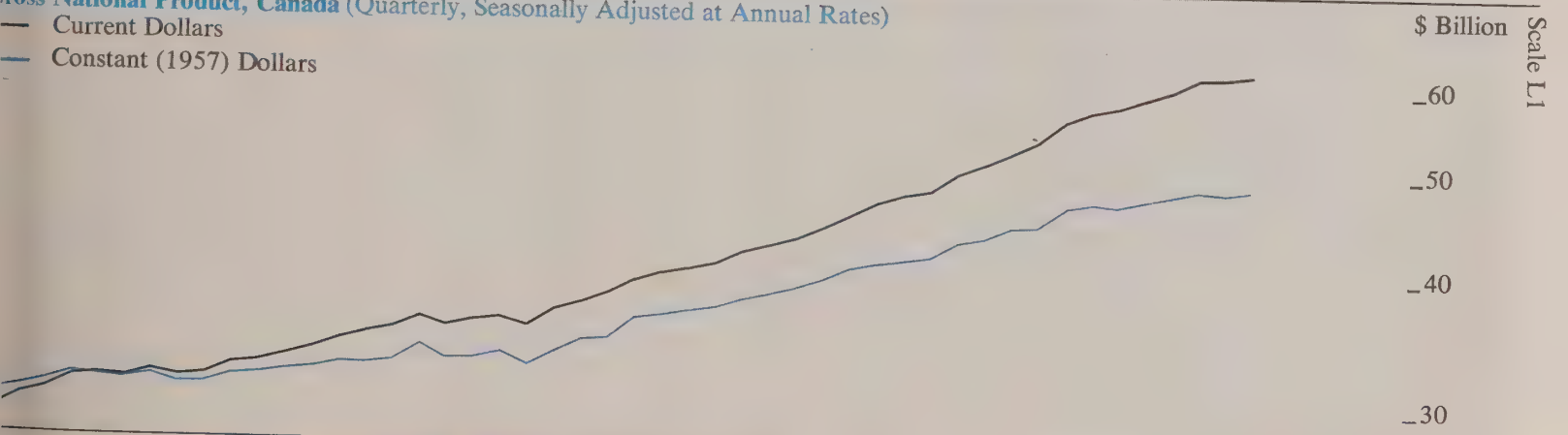


Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

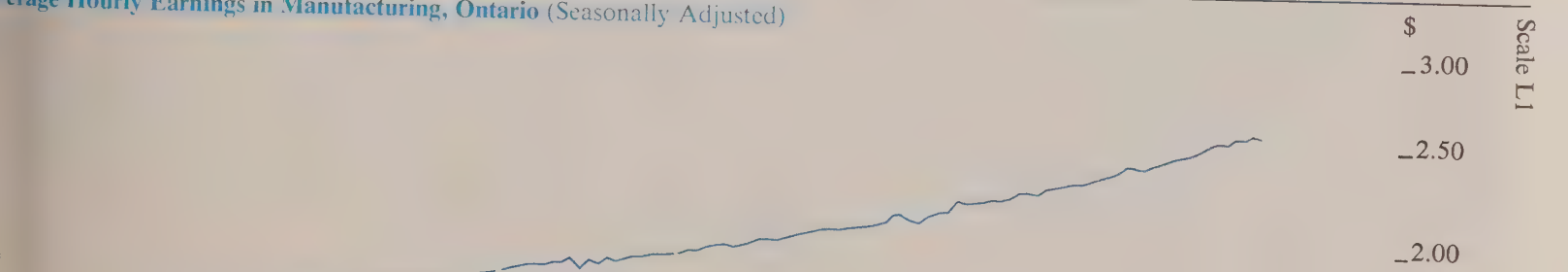


Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Coincidental and Lagging Indicators

Average Yield of 3 Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

%

Scale A



Employment, Ontario (Seasonally Adjusted)

Million

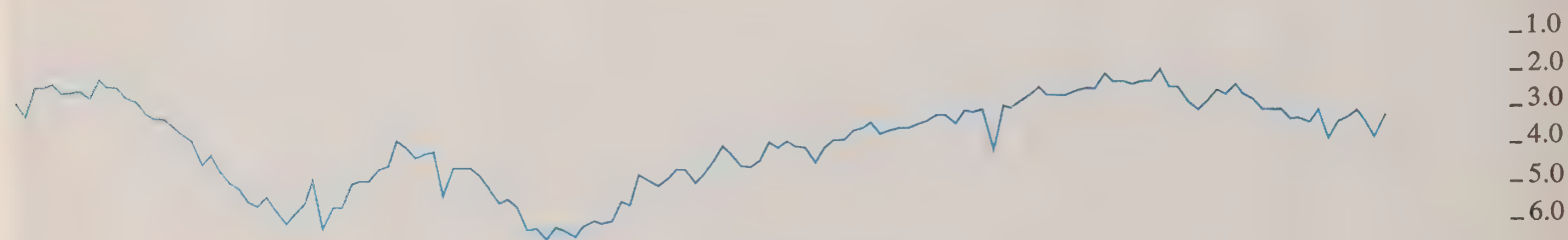
Scale L1



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of
Labour
Force

Scale A



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)

Index
1949 =
100

Scale L2



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Seasonally Adjusted

		1967										1968			
		Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April
Leading Indicators															
Average Weekly Hours Worked in Manufacturing	Number	40.1	40.2	40.3	40.4	40.5	40.4	40.4	40.4	40.4	40.9	39.9			
Orders in Manufacturing Industries ^c	\$ Million	2,981	3,094	3,024	3,117	3,242	3,107	3,161	3,178	3,118	3,308	3,215	3,060	3,045	
Business, Industrial and Engineering Construction Contracts	\$ Million	138.2	112.9	143.5	129.0	129.3	121.6	99.2	129.7	133.0	125.4	99.3	114.5	105.1	105.4
New Housing Starts	Number	61,300	62,700	60,100	57,800	48,900	57,500	72,100	66,100	61,000	58,700	76,600	72,700	79,400	69,200
Wholesale Supply	\$ Million	22,092	22,307	22,522	22,614	22,797	23,191	23,755	23,839	24,041	24,147	24,149	24,480	24,682	24,974
Wholesale Industrial Index ^a	1956 = 100	165.09	168.28	161.44	164.54	169.66	166.85	168.72	157.39	161.60	162.28	157.43	150.24	146.88	160.43
Business Failures ^a	Number	59	73	40	59	52	26	34	79	43	73	54	59	87	52
Business Failures - Liabilities ^a	\$ Million	2.7	2.6	3.3	2.9	3.2	4.1	2.6	16.6	2.9	24.3	2.6	1.8	5.6	6.4
Coincidental and Lagging Indicators															
Gross National Product ^c (Annual Rate)	\$ Million	60,836			62,072			62,372			62,992				
Average Hourly Earnings in Manufacturing	\$	2.46	2.47	2.49	2.51	2.55	2.56	2.56	2.58	2.58	2.60	2.59			
10-Year Treasury Bill Rate ^{c,u}	%	4.13	4.00	4.24	4.28	4.32	4.34	4.76	4.95	5.46	5.95	6.29	6.80	6.98	6.99
Checks Cashed in Clearing Centres ¹	\$ Million	4,657	5,088	4,964	5,154	5,121	4,983	5,133	5,081	5,459	5,485	5,006	4,959		
Foreign Trade	\$ Million	711	720	707	761	728	749	773	757	770	761	789	775		
Labour Force	000's	2,816	2,830	2,835	2,844	2,862	2,860	2,851	2,853	2,860	2,856	2,857	2,892	2,869	2,890
Unemployed	000's	2,729	2,742	2,748	2,750	2,767	2,763	2,762	2,746	2,764	2,762	2,769	2,793	2,760	2,796
Employed	000's	87	88	87	94	95	97	89	107	96	94	88	99	109	94
Unemployed as % of Labour Force	%	3.1	3.1	3.1	3.3	3.3	3.4	3.1	3.8	3.4	3.3	3.1	3.4	3.8	3.3
Wages and Salaries	\$ Million	1,034	1,045	1,051	1,053	1,064	1,071	1,075	1,070	1,086	1,094				
Index of Industrial Employment	1961 = 100	125.5	125.3	124.7	124.4	124.9	124.6	124.6	124.4	125.7	125.8	126.1	124.3		
Index of Industrial Production ^c	1949 = 100	277.1	280.7	280.0	280.8	283.6	284.6	284.3	282.4	289.4	291.0	288.2	284.9	286.1	
Non-Durables ^c		246.3	249.7	246.9	247.3	249.0	250.9	251.7	247.5	256.3	257.1	253.1	248.6	250.2	
Durables ^c		241.0	244.5	242.7	245.1	243.8	245.0	246.0	246.2	249.0	247.1	247.1	249.9	255.0	
Capital Goods ^c		252.5	255.7	251.8	249.9	255.2	257.7	258.3	249.0	264.8	268.9	260.2	247.0	244.6	
Electric Power and Gas Utilities ^c		401.9	411.4	415.4	424.2	428.4	426.2	421.9	431.2	425.7	440.7	422.8	433.2	437.6	
Electric Power Demand (Annual Rate)	BKWH	541.9	539.1	563.2	555.1	572.9	565.5	555.8	568.0	571.7	572.9	605.9	597.0	582.8	
Electric Power Demand (Annual Rate)	BKWH	50.41	50.59	51.86	50.15	51.03	51.80	51.27	52.40	53.80	52.99	55.51	55.34	54.23	
Exports (including re-exports) ^c	\$ Million	897.8	971.0	951.3	962.6	914.5	925.2	861.3	956.7	969.4	1,023.0	1,078.9	1,142.8	1,130.0	
Imports ^c	\$ Million	850.9	969.5	911.2	893.5	928.6	900.1	921.8	889.5	882.5	928.7	974.5	1,093.9	968.1	
Classified Indicators															
Gold and Foreign Exchange Reserves ^{c,u}	U.S. \$ Million	2,203	2,188	2,195	2,169	2,183	2,198	2,221	2,303	2,277	2,268	2,175	2,490	2,244	2,416
Wholesale Materials Price Index ^{c,u}	1935-39 = 100	252.2	252.5	254.6	256.7	253.0	252.0	251.2	250.1	252.9	254.3	253.8	252.4	253.0	
Consumer Price Index ^{c,u}	1949 = 100	146.5	147.8	148.1	148.8	150.2	150.9	150.7	150.5	151.0	151.8	152.6	152.7	153.2	

Statistics for Canada.

Seasonally adjusted.

Also less Toronto.



Ontario Economic Review

May/June 1968
Volume 6, Number 3

Treasury Department—Finance and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
H. Ian Macdonald, Deputy Minister



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The Ontario Economy

Potato Marketing in Ontario

L. Bodnar, *Economist*
Treasury Department, Finance and Economics

Selected Economic Indicators

A publication of the
Treasury Department –
Finance and Economics
Government of Ontario

Hon. Charles S. MacNaughton
Treasurer of Ontario
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Treasury Department, Finance and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About the Review

The feature article for the May-June edition of the *Ontario Economic Review* analyses the main aspects of the marketing of table potatoes in Ontario and evaluates the impact of the changing pattern of marketing on the structure of the potato growing industry. Relevant information was obtained primarily through field surveys and personal interviews supported by official statistical data.

The article was prepared by Mr. L. Bodnar, Economist with the Economic Planning Branch in the Policy Planning Division of the Treasury Department, Finance and Economics. Statistical design and numerical analysis were carried out by the Ontario Statistical Centre in the Statistical Services Division of the Department. The project was initiated in the Applied Economics Branch of the Office of the Chief Economist, prior to the recent merger of that office with the Treasury Department.

Indicator Charts, Pages 13-15

Fluctuations in aggregate economic activity – commonly used to define business cycles – do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate – because they relate to future rather than present production – are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 13-15 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used – 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) – only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

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Gross National Product

The pace of the Canadian economy accelerated during the first quarter of 1968 after more than six months of slow growth. Recently published DBS figures indicate that Gross National Product increased by 2.9 per cent over the fourth quarter of 1967 to an annual rate of \$64.8 billion. After allowing for about a one per cent rise in prices, this gain was reduced to two per cent in real terms. The advance occurred despite major strikes in the automotive industry.

Using the purchasing value of the Canadian dollar in 1957 as a base, GNP in January, February and March was running at an annual rate of \$50.18 billion. This was an increase of 3.3 per cent from the corresponding figure a year earlier and 1.9 per cent from the final three months of 1967.

An increase of over four per cent in total demand provided evidence of a quickening in economic activity. This was reflected in significantly higher exports which were largely attributable to the considerable upsurge in the U.S. economy. The rise of over five per cent in Canadian final domestic demand was also unusually high. Contributing significantly were the increase in gross fixed capital formation and the marked acceleration in consumer spending. Almost half of the increase in demand was met by foreign supplies, as total imports rose strongly in line with exports.

The percentage increases in total exports and imports of 8.8 and 10.4 per cent respectively were among the largest on record. In addition to the stimulus provided by buoyant economic conditions in the United States, Canadian merchandise exports, especially of motor vehicle parts and of metals, were helped by special strike-oriented factors in that country. A sharp rise in the rate of investment in machinery and equipment contributed to the increase in imports. In absolute terms the deficit on current account (on National Accounts basis) remained small relative to recent experience; it rose from \$12 to \$396 million, entirely due to adverse movement in invisibles.

Construction

Southam Building Guide recorded reduced values for construction contract awards in Ontario in May compared with last year. A total of \$216.9 million was 19.4 per cent below the May 1967 value of \$269.2 million. This is largely a reflection of the significantly reduced levels of residential, industrial

and engineering construction activity. In May, for example, residential construction awards were \$84.9 million, down \$30.1 million or 26.2 per cent from \$115.1 million in May 1967. In the province both apartment and residence contract awards were lower by 40.6 and 10.2 per cent respectively, than in May 1967. In Toronto similar awards were lower by 49.7 and 7.1 per cent respectively for the corresponding period. Industrial awards were down 24.4 per cent as manufacturing and processing plant awards dropped by \$12.5 million. Engineering awards dropped sharply by 24.6 per cent while business construction awards rose by 21.3 per cent to \$16.4 million.

Large construction awards for the month of May, each valued at \$1.0 million or more, totalled \$97.9 million. Some are listed below.

Despite the fact that total 1968 Canadian construction contract awards have established a new all-time record high for this five-month period, Ontario's five-month performance is down 5.3 per cent from the corresponding period in 1967. Cumulative gains have been recorded for four construction categories in all geographical regions of Canada except Ontario. In the January to May period this year, Ontario's total construction awards reached \$860.8 million, down \$48.3 million from the same period in

1967. Reduced total values were recorded in industrial construction awards, down 37.6 per cent to \$104.6 million and engineering awards, down 37.4 per cent to \$121.8 million. Buoying up the overall total for the five-month period has been the significant 44.6 per cent increase in total business construction awards, rising from \$72.2 million to \$104.5 million and more moderate increases of 11.6 per cent and 11.7 per cent for residential and institutional awards respectively.

In residential construction activity the actual number of housing starts for the month of May totalled 8,578, a rise of 4.4 per cent over the 8,213 units started in May 1967. After allowing for seasonal fluctuations, May activity represented an annual rate of 63,200 units compared to 69,200 in April of this year. Housing starts in Ontario centres of 10,000 population or more were 22,498 units for the year to date which is 24.4 per cent higher than the 18,087 units started in the January to May period last year. May starts in Toronto at 4,313 brought the cumulative total to 12,238, 25 per cent higher than last year. The cumulative totals and percentage changes for other major centres in Ontario were as follows: Hamilton, 1,978 units, up 35.2 per cent; Ottawa, 1,214 units, up 9.1 per cent; Kitchener, 1,033 units, up 12.0 per cent; London, 1,279

Large Construction Awards Placed Recently in Ontario

Location	\$ Million	Description
Brampton	1.0	Bridge
Cornwall	1.8	Plant Addition
Galt	1.1	Apartments
Gloucester Twp.	1.2	Housing
Hamilton	2.5	Apartments
Hamilton	8.0	Schools
London	13.6	Schools
Oakville	2.2	Apartments
Ottawa	1.1	Public Bldg. additions
Pickering	1.2	Pumping Station
St. Catharines	2.0	Store
Toronto (metro)	14.1	Apartments
Toronto	9.2	Rapid transit projects
Toronto	6.9	Sewage plant addition
Welland	1.0	Office building
Windsor	3.8	College building
Various locations	19.9	Provincial highway and bridge contracts

Source: Southam Building Guide.

awards dropped sharply by 24.6 per cent while business construction awards rose by 21.3 per cent to \$16.4 million.

Large construction awards for the month of May, each valued at \$1.0 million or more, totalled \$97.9 million. Some are listed in the table on page 1.

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Dwelling unit completions numbered 3,835 in May, bringing the total to date for 1968 to 19,408 — up 1.0 per cent for the

January to May period of 1967. With the exception of Metropolitan Toronto all of the above-mentioned centres have had a greater number of housing completions this year. At May 31, 1968, there were 46,914 dwelling units under construction in urban Ontario, 36.2 per cent more than the 34,448 units under construction one year earlier.

Productivity Trends

The Dominion Bureau of Statistics recently reported that during 1967, output per man-hour in the nonagricultural industries of Canada increased by 1.7 per cent over the preceding year. This was a smaller gain than the increase of 2.7 per cent recorded for 1966. On an output per person employed basis, the gain was even less, at 1.3 per cent, because of the decrease in average hours worked which occurred. While in past years slackening productivity has generally seemed to accompany sharp rises in output and especially employment, the 1967 slowdown was associated with moderating growth rates for both these variables.

As the most important single sector in the nonagricultural aggregate, manufacturing was largely responsible for the small productivity increase. The annual gain in output per man-hour decreased from 2.6 per cent in 1966 to 1.4 per cent in 1967 in manufacturing, while the corresponding gains in output per person dropped from 2.0 per cent to 0.9 per cent. In the nonmanufacturing industries, output per man-hour increased during 1967 by 2.1 per cent, compared to 2.6 per cent in the previous year, and output per person by 1.6 per cent, the latter rate being the same as in 1966.

In 1966, the above-average crop in agriculture had resulted in an unusually large productivity increase in that sector and contributed importantly to the 4.6 per cent and 3.6 per cent increase in output per man-hour and output per person respectively for total industrial activity. In 1967, however, an 8.0 per cent decrease in agricultural output and a simultaneous increase in labour input resulted in absolute decreases in agricultural productivity of 8.8 per cent for output per man-hour and 10.5 per cent for output per person employed. Consequently, for the commercial industries as a whole, the increases of output per man-hour and per person were 0.8 per cent and 0.2 per cent respectively.

In the United States, output per person employed in the total private economy during 1967 increased by 0.2 per cent, that is, by the same amount as in the corresponding sector of the Canadian economy, although the increase of 1.4 per cent in output per man-hour was somewhat larger than in Canada, because of the greater decrease in average hours worked. However, these figures reflect quite a different experience vis-a-vis Canada in the industrial components of the aggregate, particularly in the case of agriculture, where above-average productivity gains of about 10 per cent occurred during 1967.

In the private nonagricultural sector, on the other hand, last year's increase of 0.9 per cent in output per man-hour was about half the corresponding increase in Canada, and output per person employed actually decreased by 0.3 per cent. Output per man-hour increases in the manufacturing and nonmanufacturing sectors of the private U.S. economy were 0.8 per cent and 1.1 per cent respectively in 1967 as against 2.2 per cent and 2.6 per cent in 1966. Output per person in the manufacturing sector decreased by 0.1 per cent while remaining unchanged in the nonmanufacturing sector in 1967. In 1966 these sectors experienced increases of 2.2 per cent and 1.7 per cent respectively.

B and B's Recommendations and Ontario

The first volume of the Report of the Royal Commission on Bilingualism and Biculturalism called for official bilingualism in Ontario and New Brunswick and for the creation of bilingual districts in eight provinces. Ontario, British Columbia and Newfoundland were exempted from this latter recommendation.

The first volume entitled "The Official Languages" was released on December 1, 1967. Its recommendations applied both to the provinces and to the federal government. Among the provinces, Ontario and New Brunswick received the most attention: The Commission recommended that both provinces recognize the English and French languages in their legislatures, public service, schools and courts. Of the 54 suggested bilingual districts in Canada (that is, places where there is an official-language minority of 10 per cent), 43 are in Ontario and Quebec and New Brunswick.

When the Report was released, Quebec was the only officially bilingual province. At the Federal-Provincial Conference of Prime Ministers and Premiers held in Ottawa, February 5 to 7, New Brunswick followed suit. When New Brunswick passes its Official Languages Act this fall or early next year, 87 per cent of all Canadians of French mother tongue will be living in provinces where the French and English languages will be recognized in statutes.

The Commission also said that Manitoba (with 61,000 French-speaking residents according to the 1961 census) and Nova Scotia (with 40,000) "may of their own volition even wish to become officially bilingual provinces." Other provinces could become bilingual as soon as their language minority reaches 10 per cent of the population, the report recommended.

In the officially bilingual provinces, the report suggested: (1) that both English and French be used in the debates of the legislatures and in legislative publications; (2) that judicial services be provided in both languages, including appeals to higher courts; (3) that education be provided in both languages; (4) that municipal governments make administrative services available in both languages; and (5) that all government offices in bilingual districts be staffed with both English and French-speaking personnel.

Ontario's Position

Ontario's sympathy with most of the recommendations was apparent even before the Report was released — as was evident at the Confederation of Tomorrow Conference. On February 5, during the opening session of the Constitutional Conference, Prime Minister John Robarts expressed Ontario's position, "We endorse the guiding principle and spirit of the first volume: that both official languages be recognized wherever the minority is numerous enough to be viable as a group." However, he emphasized (as did the Report) that an "officially bilingual province" did not mean that everybody in the province would speak or would have to speak two languages. Only the major public institutions would provide bilingual services to citizens,

most of whom could and would likely be unilingual.

Mr. Robarts announced he would propose by resolution at the February opening of the Ontario Legislature that any member should have the formal right to address the Legislature in either English or French. He also announced that selected civil servants would be given French-language training; that all correspondence received in French would be answered in French; that field offices of Government departments in French-speaking areas would be encouraged to provide services in French; and that the Government would expand its translation bureau.

In municipal administration, he stated, the use of both English and French would be encouraged in French-speaking areas by such steps as:

- the employment of bilingual staff;
- the provision in both English and French of assessment notices, water bills, voters lists, etc.;
- the design of road and traffic signs that could be readily understood by everyone;
- the amendment of the Municipal Act so that a record of council meetings could be kept in French as long as English translations were available for use in the courts or before the Ontario Municipal Board;
- the investigation of feasible ways to reimburse cooperating municipalities for such extra expenses as might be involved in providing bilingual services.

In the administration of justice Mr. Robarts stated that Ontario would examine the possibilities of meeting the expenses incurred for appropriate interpreters and translation services in any pleading or process before courts under provincial jurisdiction. The use of bilingual court documents in areas with sufficient French-speaking residents would also be studied. And, in education, he had already announced on August 24, 1967 that French-language secondary schools

would be established within the public school system.

Finally the Prime Minister reported that his Government had established four task forces — each to investigate the feasibility of implementing the recommendations of the B & B Report concerning (a) the administration of justice; (b) the Legislature and provincial statutes; (c) municipal administration; and (d) the provincial public service.

Progress Since February 5

Since the enunciation of the Ontario position, the four task forces have been meeting. They are composed of officials from the departments concerned and from the Federal-Provincial Affairs Secretariat of the Treasury Department. The Secretariat is responsible for coordinating the work of the four task forces which will submit their reports to the Prime Minister during the summer. Further investigations are likely to be undertaken on other aspects of this first volume: for example, on the question of bilingual districts and on the contents of other volumes of the Report which will be published over the next year.

Legislation to establish French-language secondary schools was introduced in the Ontario Legislature on May 30 by the Minister of Education who said: "With the creation of French-language schools at the secondary level, there will be assured to every French-speaking student in the province the opportunity to receive his education from kindergarten through university . . . in the language of his choice."

An important step taken at the Constitutional Conference in February was the consensus on language rights. Both the provinces and the federal government recognized that French-speaking Canadians outside of Quebec should, as a matter of equity, have the same rights as English-speaking Quebecers in Quebec. They also agreed that governments should act to ensure these rights. An Official Languages sub-committee of the Continuing Constitutional Conference has been established to discuss methods of implementation and possible constitutional amendment.

Potato Marketing in Ontario

L. Bodnar, *Economist*

Treasury Department, Finance and Economics

MAIN CHARACTERISTICS OF POTATO GROWING IN ONTARIO

Potato growing in Ontario occupies a relatively minor position in the agriculture of the province although Ontario annually supplies a significant proportion of Canada's total potato production. In 1966, 18.3 per cent of total Canadian potatoes were produced in Ontario, while the Maritime provinces — traditional potato growers — together accounted for 47.9 per cent. In terms of acreage, Ontario had 52,100 acres, or 16.2 per cent of the Canadian total under production in 1966 compared with 38.3 per cent for the three Maritime provinces. However, in terms of total agricultural cash income in Ontario the contribution of potatoes was only 1.9 per cent in 1966. The comparable figure for the Maritimes was 20.6 per cent. In Prince Edward Island potatoes accounted for 32.8 per cent of total agricultural cash income.

Potato Acreage, Canada and Ontario 1961-1966

Year	Canada ¹ Thousands of acres	Ontario Thousands of acres	Ontario Per Cent of Canada
1961	305.7	51.5	16.9
1962	288.1	49.9	17.3
1963	285.4	51.0	17.9
1964	281.2	53.0	18.9
1965	298.8	56.0	18.7
1966	319.0	52.1	16.3

¹Excludes Newfoundland, Yukon and the Northwest Territories.

Source: DBS and Canada Department of Agriculture.

Potato Shipments to Ontario from Other Provinces, 1965 and 1966

Shipments From	1965		1966	
	000's cwt.	Per Cent	000's cwt.	Per Cent
Prince Edward Island	2,230	65.1	2,022	65.8
New Brunswick	1,118	32.7	980	31.9
Quebec	71	2.1	42	1.4
Manitoba	4	0.1	10	0.3
Alberta	1	¹	19	0.6
Total Shipments to Ontario	3,424	100.0	3,073	100.0

¹Less than 0.05 per cent.

Note: A comparable breakdown by provinces for earlier years is not available.

Source: Ontario Food Council.

Despite the fact that Ontario produces a respectable share of Canada's total potato production, the province is not self-sufficient. From 1961 to 1966, 18 to 26 per cent of the total quantity of potatoes used in Ontario came from other provinces, mainly the Maritimes. According to the Ontario Food Council, Prince Edward Island accounted for 65.8 per cent and New Brunswick for 31.9 per cent of total volume of potatoes moved to Ontario's markets from other provinces. Maritime potatoes enter the Ontario market in late October and over the following months gradually occupy a more significant position.

Most potato imports are from the United States and consist of tablestock and processing potatoes. The bulk of imports are early potatoes which enter Ontario before the province's new potatoes are ready for the market in large volume. From 1961 to 1966 imports made up 2.3 to 5.8 per cent of total potatoes used in Ontario. Exports and shipments to other provinces are insignificant. The majority of Ontario potatoes are consumed within the province.

Requirements for Production

The successful production of potatoes requires both special soil and climatic conditions. Potato production is thus concentrated in areas where these favourable conditions prevail. The type of soil in which potatoes are grown may affect dry matter content of tubers because of the water-holding capacity, drainage, aeration, structure, temperature and fertility. Any of these factors could cause differences in the dry weight of potatoes.

The ideal potato soil is a rich, deep, well-drained, medium loam, free from stones moderately acid (pH 4.8 to 6.5) soil containing adequate organic matter. Such a soil warms up quickly in the spring and has a high natural fertility and water-holding capacity, plus good aeration for the development of the tubers.

This does not mean that other soils are not suited for potato production. However, the use of soils which are too coarse or too fine in texture will lead to difficulties in some years. Very coarse soils dry out too much in dry years, delaying germination, reducing

Farm Cash Income, Total and from Potatoes, Canada and Provinces, 1961-1966

Year	Canada			Ontario			Maritimes		
	Total \$'000	Potatoes \$'000	Per Cent of Total	Total \$'000	Potatoes \$'000	Per Cent of Total	Total \$'000	Potatoes \$'000	Per Cent of Total
1961	2,926,061	46,409	1.6	874,110	12,682	1.5	109,035	14,613	13.4
1962	3,172,101	45,932	1.4	924,199	12,520	1.4	111,989	15,599	13.9
1963	3,212,650	49,882	1.6	996,936	13,974	1.4	113,599	19,041	16.8
1964	3,499,373	64,909	1.9	1,020,275	14,875	1.5	125,857	29,542	23.5
1965	3,818,281	104,311	2.7	1,103,964	25,413	2.3	152,513	46,359	30.4
1966	4,273,575	80,501	1.9	1,241,915	23,161	1.9	146,590	30,233	20.6

Source: DBS and Canada Department of Agriculture.

Potato Production, Canada and Ontario, 1961 to 1966

Year	Canada ¹ 000's cwt.	Ontario 000's cwt.	Ontario Percentage of Canada
1961	44,108	9,819	22.3
1962	46,671	9,581	20.5
1963	45,809	9,792	21.4
1964	47,733	10,494	22.0
1965	46,472	10,584	22.8
1966	54,679	10,003	18.3

¹Excludes Newfoundland, Yukon and the Northwest Territories.
Source: DBS and Canada Department of Agriculture.

and stunting top growth. Because of reduced top growth, weeds grow uncontrolled and soil temperatures rise to the point where after-cooking darkening is encouraged and increased respiration in the tubers causes loss of dry matter. Most Ontario potatoes are grown in relatively coarse textured soils and, when well managed, produce high yields. These soils are also well suited to mechanized potato production.

Fine-textured soils tend to remain cold and wet in the spring, causing seed pieces to rot in the ground. Compaction later in the season often causes misshapen tubers and difficulties at harvest time.

Present commercial varieties are derived from species originating in the mountainous regions of Chile in South America. The growing season at these high altitudes has moderate temperatures and long days, conditions which are found in the main potato-growing districts of Southern Ontario.

A mean daily temperature of 65° to 70°F. during July is considered best for highest yields, together with a rainfall of one inch per week throughout the growing season. Lack of adequate moisture in July and early August is usually the most serious factor limiting potato production in Ontario.

Potato yields in Ontario have dramatically increased during the 1911 to 1965 period. Yields began to rise in the late thirties and have continued to do so at an accelerated rate since 1950. Potato yields in Ontario surpass the Canadian average.

Although three-quarters of Ontario potatoes are sold as table potatoes, the share of potatoes used for processing is steadily rising. The Ontario potatoes used for processing accounted for only 8.6 per cent of total potato production in the province in 1960,

the figure for 1966 rose to 17.9 per cent. And the trend is upwards. The chief forms of processed potatoes at present are: potato chips, frozen french fries, dehydrated (flakes, granules) and pre-peeled potatoes.

Potato Yield per Acre,
Canada and Ontario, 1961 to 1966

Year	Canada ¹ cwt.	Ontario cwt.
1961	144.3	190.7
1962	162.0	192.0
1963	160.5	192.0
1964	169.7	198.0
1965	155.5	189.0
1966	171.4	192.0

¹Excludes Newfoundland, Yukon and the Northwest Territories.

Source: DBS and Canada Department of Agriculture.

The marketing of potatoes for processing has become very organized because most processors make contracts with growers (before the crop is sown) to buy their entire crop. Thus the grower is assured of a market and the processor of shipments of the quality required. Some processing companies grow a part of their own requirements. Some purchases are also made on the open market.

MARKETING TABLE POTATOES
IN ONTARIO

Experts estimate that 70 to 75 per cent of Ontario-grown potatoes are sold as table potatoes. In the past decade the marketing of table potatoes in Ontario has undergone

many changes due to the increasing scale of operation (both at farm level and at the retail trade level), the improvement in farming technology and the development of more rapid and efficient transportation and communication services. Other important changes include the growth of supermarkets, which at present cover an estimated 60 to 65 per cent of total table potato sales at retail level, and the development of packing techniques.

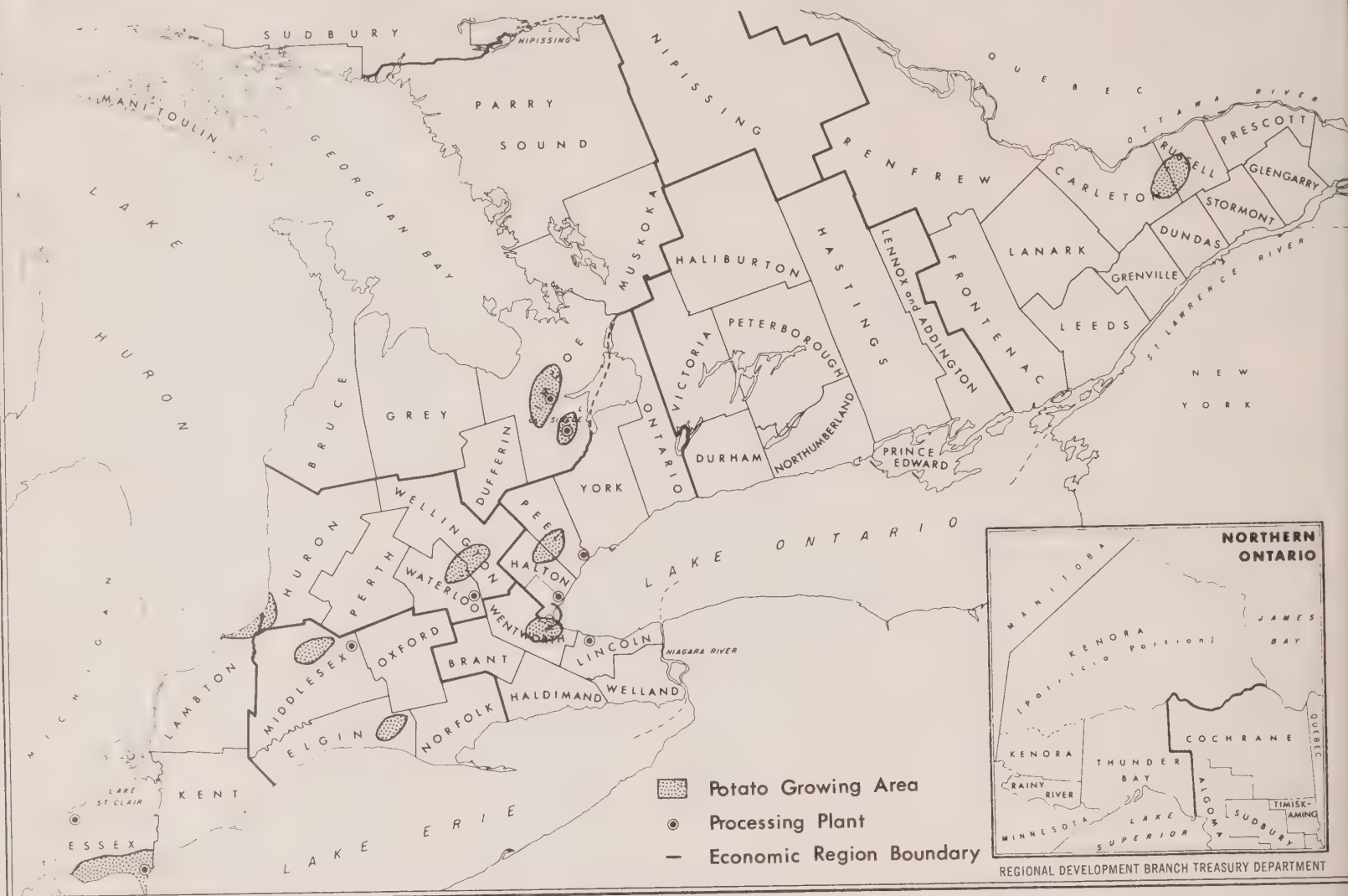
An analysis of potato marketing in Ontario indicates that a limited number of grower-packers who sell exclusively to chain stores operate well-mechanized 800-1,000 acre farms. These grower-packers have an assured market for their product. But many other farmers have no connection with corporate chains and have to market their produce through these large grower-packers. This situation leads to varying degrees of dependence upon these large grower-packers and, indirectly, upon chain stores.

Marketing Table Potatoes at Farm Level

The system of marketing table potatoes at the farm level varies considerably, depending upon size of operation, location, personal ability and inclination of the grower.

- A small-scale grower (less than 50 acres) usually has no more than a one-row potato digger. He fills 75 lb. bags on the field and sells directly to the trucker.
- The same type of grower delivers the potatoes in bulk to his farm storage (which is usually a converted barn), provides some grading and sells his produce, as a rule, in 75 lb. bags to the trucker, or local stores.
- In another frequently used method, the grower delivers and sells his produce to a packing station (usually farmer-owned) where the potatoes will be graded and packed in 10, 25 and 50 lb. bags.
- Farmers' markets also have some importance in potato marketing. The largest of these farmers' markets is located at the Ontario Food Terminal and provides parking and selling space for 350 vehicles. Most of the produce sold on the Toronto farmers' market originates within a 50-mile radius of the market, but occasionally growers come from as far as Leamington. In 1963, the estimated 3,280 tons of potatoes sold on the farmers' market of the Ontario Food Terminal represented six to seven per cent of total potatoes grown in the province.

MAJOR POTATO GROWING AREAS IN ONTARIO



The possibilities in selling potatoes are even more numerous. Larger growers have their own grading stations and sell their produce in 10, 25 and 50 lb. bags to local independent grocers and small chain stores.

One of the largest potato growers in the province, with an area of 700-800 acres, has his own sales organization with a full-time sales manager and storage facilities for 320,000 (75 lb.) bags. This operator washes, packs and sells his own produce directly to chain stores, dealers and institutions.

Marketing Co-operatives in Essex County

In Essex County, especially in the area adjacent to the shore of Lake Erie, the early springs facilitate the production of a variety of early crops. The shipment of early potatoes in the Harrow-Leamington area usually commences in July — several weeks before

Wholesale Prices of Early Potatoes in Leamington Area, June 30 to Sept. 7, 1966

Date	Price Per 25 lb. Bag ¹
1966	\$
June 30	2.50
July 8	2.25
July 15	1.75
Aug. 3	1.75
Aug. 23	1.70
Sept. 7	1.65

¹Less 10 per cent commission to broker and 35¢/75 lb. bag transportation costs to Toronto.
Source: Local growers.

other potato-growing areas in the province. Time is the major factor affecting prices this period of the year. From June to September 1966 the wholesale prices of early potatoes in the Leamington area varied from \$2.50 to \$1.65 for a 25 lb. bag.

Growers in this area complain that potato growing is seriously hindered by the unorganized character of the market and instability of prices. Supply of produce varies unpredictably from day to day in response to weather conditions. Early potatoes being perishable, an increased supply over a period of a few days quickly translates itself into downward pressure on prices. As already mentioned, processing potatoes are generally grown under contracts written between growers and processors in advance of planting. Early potatoes, on the other hand, are subject to abrupt changes in price behavior.

even within a week — that can result not only from the erratic local supply but from the seasonally oriented demand, and from the competition of other potato growing areas (especially Port Stanley). In addition there is the large unknown factor of U.S. imports. During 1967 Virginia potatoes were brought on the market a month before the Essex potatoes.

The marketing co-operatives in the area help improve the marketing situation to a certain extent. The potato growers' co-operative in Harrow, for example, acts on behalf of the growers who represent the majority of local potato growers.

The services of the major co-operative in Essex County include the grading, packing and merchandising of potatoes. Toronto (60 per cent of total sales), Halifax (20 per cent) and Montreal (15 per cent) constitute the main markets. A small volume of the balance is sold to truckers. In the main season — July to September — the co-operative contacts the major customers daily, obtains information on prices and demand, and advises the growers as to the required volume of shipments to the central warehouse.

In the Leamington area another co-operative operates in a similar way. However, this co-operative represents only a minority of the local potato growers. There are 10 private shippers in the area, working independently on behalf of chain stores and major dealers in chain stores. There is keen competition on the local market. Sometimes six of the 10 shippers may contact the same broker or dealer in Toronto and, conversely, several farmers may attempt to sell their produce to the same shipper. This two-way competition generally results in depressed prices. It only requires one local grower, willing to sell at a price lower than all others, to establish a price for the whole local market.

Marketing Group in

Port Stanley Area (Elgin County)

There are approximately 25 potato growers in the area of Port Stanley, Union and Wyndham, growing a total of 1,000 to 1,200 acres of potatoes. The bulk of the area's potatoes is marketed between mid-July and early August, that is, two to three weeks earlier than the Essex potatoes, and a few weeks earlier than the remainder of the province. This situation offers a definite advantage to the local growers: they sell some 60 per cent of their produce on the fresh market, while the balance goes to processing companies.

One of the leading potato growers of the area operates a 300-acre farm and acts as the local potato growers' representative. He sells his own and a great amount of local potatoes to major dealers, and to chain stores through brokers.

Packing Houses

An estimated 50 to 55 per cent of the total volume of Ontario-grown table potatoes is sold to packing houses also known as grading stations. Two-thirds of this volume is handled by five or six major operators with a plant capacity of 5,000-10,000 (75 lb.) bags each per week.

Most packing houses (small and large) are owned by individual potato growers who utilize them for their own produce, and also for handling potatoes purchased from other growers.

The services of the packing houses include grading (under the supervision of a government inspector), packing in 10, 25, 50 and 75 lb. bags, and selling. Generally, the major packing houses serve regular customers. Volumes required by buyers are conveyed weekly, whereas prices fluctuate on a day-to-day basis. The customers of the packing houses are brokers, dealers, institutions and — probably most important — the chain stores.

One of the major packing houses has one large grading unit, employing 30 workers from August to early November. The company owns and operates a 500-acre potato farm and also has financial control over a neighbouring farm of similar size. These two farms provide about half of the total volume handled and sold by the company, while the balance is purchased from 15 to 18 Ontario growers. The company also sells P.E.I. potatoes during the winter. This packing house supplies directly to chain stores, to a dealer in Northern Ontario and to potato processors on a minor scale. Another major grower-packer sells to two customers only — both corporate chains. The company grows about 1,000 acres of potatoes, operates controlled temperature warehouses, possesses its own shipping fleet of 24 delivery trucks, and purchases, handles and resells Ontario and P.E.I. potatoes. A third large packing company represents a border case between the grower-packer and the vertically integrated operator. It owns and operates a 300-acre farm and produces potatoes on some 100 acres. In addition, the company operates a potato chip plant and acts on behalf of a corporate chain as packer-dealer.

Truckers

The trucker makes his purchases directly from the farmer and usually follows his own schedule. He sells the produce to institutions, restaurants, independent grocery stores, wholesalers and, occasionally, at the farmers' market in Toronto.

Primary Wholesalers

Primary wholesalers are initial recipients of produce in the market. There are only five primary wholesalers in the province specializing in potatoes.¹

One of the largest independent firms in this category purchases potatoes from truckers at the Ontario Food Terminal or buys them directly from growers, occasionally on a commission basis. In October, the firm begins to sell P.E.I. potatoes at an increasing rate. By November, no Ontario potatoes are sold at all. Each week, the firm serves approximately 300 customers, such as individual grocery stores, secondary wholesalers, hotels and other institutions — and occasionally chain stores.

Another wholesale firm has a Toronto-based head office and 26 branches throughout Ontario. The central office issues daily market bulletins indicating price quotations, but the local branches hold the authority to buy directly from growers and sometimes from dealers. The branches purchase potatoes already graded and packed. In order to work efficiently they prefer to contact rather large-scale growers who are able to deliver at least a truck-load of potatoes. Their customers tend to be individual retailers, institutions and small chain stores.

Dealers

Dealers sell potatoes to retail stores (individual and chain stores). Five of them are located at the Ontario Food Terminal, and a further six in other parts of the province (London, Hamilton, Oshawa, Shelburne). In addition, a large number of local shippers who buy potatoes directly from growers and sell to chain stores, large dealers and truckers, etc., may be classified in this category.

The marketing pattern and size of operation of the potato dealers vary considerably. For example, one dealer at the Ontario Food Terminal usually sells to chain stores and independent retailers, and purchases directly from growers. At present, the company has about 20 grower-contacts in Ontario. These growers are generally small-scale operators with 10 to 20 acres of potatoes.

¹A great number of small firms purchase most of their produce from primary wholesalers.

Another important dealer, operates on a much larger scale, receiving potatoes in the following areas:

- (a) Leamington (from local shippers);
- (b) Ridgetown (from local dealers);
- (c) Port Stanley (from local growers);
- (d) Burford (directly from farmers);
- (e) Grand Bend (from its own packing house);
- (f) Ancaster (from a local grower with 600 acres of potatoes).

The customers of this dealer comprise chain stores in the London-Kitchener-Brantford area. The company buys huge amounts of potatoes in bulk, which are graded and packed in its own packing houses, located in London and Grand Bend.

Brokers

The five brokers specializing in potatoes have their offices at the Ontario Food Terminal. Brokers arrange transactions, on a commission basis, between buyers located primarily in Toronto, and shippers and growers from various areas, including the Maritimes. Their most important clients are chain stores, which represent 60 to 70 per cent of the total volume of transactions. Brokers normally prefer to deal with shippers and only secondarily with large-scale growers.

Usually produce buyers of the chain stores contact the brokers, indicating the required volume over the next two to three days. Chain stores may or may not specify the purchase price in advance. The next step is for the brokers to contact local shippers and growers, after which they report back to the chain stores, and again to local shippers, growers, etc.

Such an operation requires experience, flexibility and speed on the part of the broker. Sometimes they contact their clients (buyers and sellers) several times, with alternative offers for concluding a deal.

Corporate Chains and Voluntary Groups

In 1966 chain stores accounted for 53.4 per cent of total annual sales of grocery and other food stores in Ontario. At present, the corporate chains and voluntary groups sell an estimated 60 to 65 per cent of the total volume of table potatoes in Ontario. This estimate may vary among experts, but all agree that corporate chains and voluntary groups have an important influence not only over the retail trade but also over the agriculture sector. The impact on the structure

Annual Sales of Grocery and Other Food Stores, Ontario, 1961 to 1966

Year	Chain Stores		Independent ¹		Total Sales	
	\$ Million	Per Cent	\$ Million	Per Cent	\$ Million	Per Cent
1961	867	52.9	772	41.1	1,639	100.0
1962	887	52.3	809	47.7	1,696	100.0
1963	947	52.8	848	47.2	1,795	100.0
1964	1,008	53.0	892	47.0	1,900	100.0
1965	1,096	54.3	923	45.7	2,019	100.0
1966	1,146	53.4	1,002	46.6	2,148	100.0

¹Including voluntary groups (I.G.A., Red & White, etc.) in Ontario.

Source: DBS, Retail Trade.

and prospect of potato growing in Ontario is clearly identifiable. For this reason, the purchasing and merchandising patterns of the chain stores and voluntary groups will be analysed in some detail.

Present analysis includes several corporate chain store organizations and one wholesale firm that serves affiliated independent retail outlets. Most of these firms have warehouses in Metropolitan Toronto to serve retail outlets both in the metropolitan area and in other parts of the province.

The purchasing pattern of corporate chains and voluntary groups varies significantly among the individual firms as regards the quantity of produce acquired. The purchasing pattern of individual firms can take any of the following four forms.

(a) The purchasing and merchandising of one of the largest corporate chains is almost completely centralized. The chief produce buyer takes orders from the retail outlets in Toronto and from the remainder of the province two or three times a week. Approximately 90 per cent of the required volume of Ontario potatoes is delivered by a single packing house, and the rest by another large-scale packer. During the winter season, Maritime potatoes are purchased through brokers.

Potatoes are usually delivered to the corporate chain's central warehouse already re-graded and packed and are subsequently shipped to retail stores in Toronto and other parts of Ontario. Some local stores are authorized to purchase directly from growers and dealers at a price suggested by head office.

(b) Another corporate chain has several geographic divisions in Ontario. The produce department of the Toronto division acquires about 90 per cent of total requirements (both

Ontario and Maritime potatoes) from a large grower-packer, and another packing firm delivers the balance. The chain's other divisions purchase potatoes from local growers packer-growers and from local dealers. As a general rule, all the divisions of this chain prefer to contact large-scale growers, packers and dealers.

(c) A third corporate chain follows a different procedure again. This company has no permanent suppliers. Shifting from one area of the province to another, the produce buyer acquires potatoes on a daily or weekly basis contacting several brokers, dealers, wholesalers and packers. It appears, however, that two major distributors are the most important contacts. The chain operates a warehouse for grading and packing potatoes. Some of the potatoes are shipped directly to retail outlets. Two other chain stores were found to have very similar purchasing and distribution practices.

(d) Included in this study was a large wholesale firm that serves affiliated retail outlets. Both purchasing and distribution operations of this firm are centralized. Potatoes purchased by the central office are shipped to the central warehouse. After re-grading and packing into 5, 10, 15, 25 and 50 lb. bags the produce is delivered by trucks owned by the company to the local stores.

This firm acquires Ontario potatoes from

- (i) Leamington (two or three local shippers working for the company);
- (ii) Port Stanley (through brokers);
- (iii) Alliston-Beeton area (major packing houses);
- (iv) Ancaster (a large-scale grower); and
- (v) occasionally from other parts of the province.

In addition, the company operates a packing house not far from Toronto, which buys Ontario potatoes on a small scale.

Effect of Corporate Chain Stores on Farm Prices of Potatoes

The marketing pattern of Ontario potatoes at farm level follows a well-known course. During late June and early July, when growers commence their harvesting of early potatoes, prices reach maximum levels. As the harvest proceeds in Port Stanley, Ancaster and Alliston, supply increases, prices decline and drop to a minimum by late fall. Weather conditions, yields and fluctuations in potato acreage may modify this pattern to a certain extent.

By this time, the bulk of Ontario potatoes is usually sold. The farmers place the unsold potatoes in storage. In October, Maritime potatoes enter the Ontario market and gradually secure a dominant position. Many retailers and consumers prefer Maritime (especially P.E.I.) potatoes to Ontario produce, which reappears in small quantities in January.

There are some 1,400 potato growers in Ontario and several hundred buyers (truckers, wholesalers, dealers, etc.). One would, therefore, expect that the establishment of potato prices represents an exemplary case of the interaction of supply and demand through free competition. This assumption may also

be supported by the farmers' market proceedings at the Ontario Food Terminal. A varying number of farmers and truckers offer their produce to individual grocers, pedlars and other buyers. Price is therefore established as a result of direct negotiations between buyers and sellers.

The wholesale price of potatoes is fixed at the Ontario Food Market in a similar way. Buyers check and compare the offers of a number of wholesalers and, as a rule, the lowest-priced tentative deal determines the daily wholesale price. Prices quoted at the Ontario Food Terminal significantly influence prices across the province. In Leamington and other areas local shippers, dealers, packers and large-scale growers sell potatoes to retailers, institutions and chain stores, directly or through other dealers and brokers. As has been demonstrated already, many of these intermediaries work directly or via other agents on behalf of the corporate chains, following the purchasing and pricing policies of the latter. Other intermediaries, who sell to independent grocers, institutions, etc., have to adapt themselves to the price leadership of the major buyers in order to keep themselves and their clients competitive.

From the point of view of most growers and small retail outlets the marketing pattern of potatoes appears unorganized, inefficient, overlapping and sometimes even chaotic. Individually, they are not in a position to play a part in the determination of prices. Although the corporate chains also have to take into consideration the general supply-demand situation, weather conditions, etc., the prevailing high level of concentration enables them to influence prices through a selective purchasing policy. (We have already mentioned that corporate chains handle 60 to 65 per cent of total potato sales in Ontario.) The chain stores will not buy at a price higher than what they consider acceptable and they are in a position to influence prices because of the volumes they purchase. Another prominent element in the pricing process is the system of 'special or feature' sales, through which potatoes purchased at depressed prices are marketed. Independent stores must follow these established prices in order to remain in business.

Each day the produce manager of a corporate chain calls the Ontario Food Terminal, the wholesalers and brokers to obtain information on prices. He gathers information on the volume of potatoes available

at the various large packing houses and notes the retail prices of other corporate chains and their specials. The manager calculates the exact amount of potatoes required by the retail outlets of his company. After considering all these factors, he decides whom to contact and at what price level to purchase. The corporate chain is infinitely better informed than a grower with, for example, 50 acres of potatoes, and is evidently in a much more flexible position; it has multiple choices, and fully comprehends that the huge volume of potatoes required by its organization is much too important to be neglected, even if the purchase price offered is lower than the wholesale price at the Ontario Food Terminal. Corporate chains, as a rule, offer lower than the wholesale price but they never go higher. In this rather indirect fashion, Toronto wholesale prices have some influence on pricing policies practised by corporate chains.

As previously shown, some corporate chains acquire their potatoes almost exclusively from one major packer-grower. The produce buyer gathers his information on the overall situation and purchase prices are established accordingly. However, in this particular case, the exclusive packer-grower is in a position to shift the effects of low prices on to his grower-suppliers.

The present state of affairs, involving only a few buyers who control a large proportion of the market, is known as oligopsony. This results in price leadership from the buyers' side. These large buyers decide upon the prices they are willing to pay and other buyers conform. Potato growers are economically divided: most of them are weak; they sell perishable products and, therefore, their bargaining position is unfavourable. Consequently, potato marketing, which appeared on the surface to represent an exemplary case of free competition (a great number of buyers and sellers) is, in fact, dominated by a few large and powerful corporations.

Effect of Market Structure on the Potato Growing Industry

The detailed analysis of potato marketing has already indicated that a limited number of large grower-packers, who sell exclusively to chain stores, operate 800-1,000 acre potato farms. These farms are well mechanized and apply modern production methods. These large grower-packers have secured a market for their produce and are also relatively well

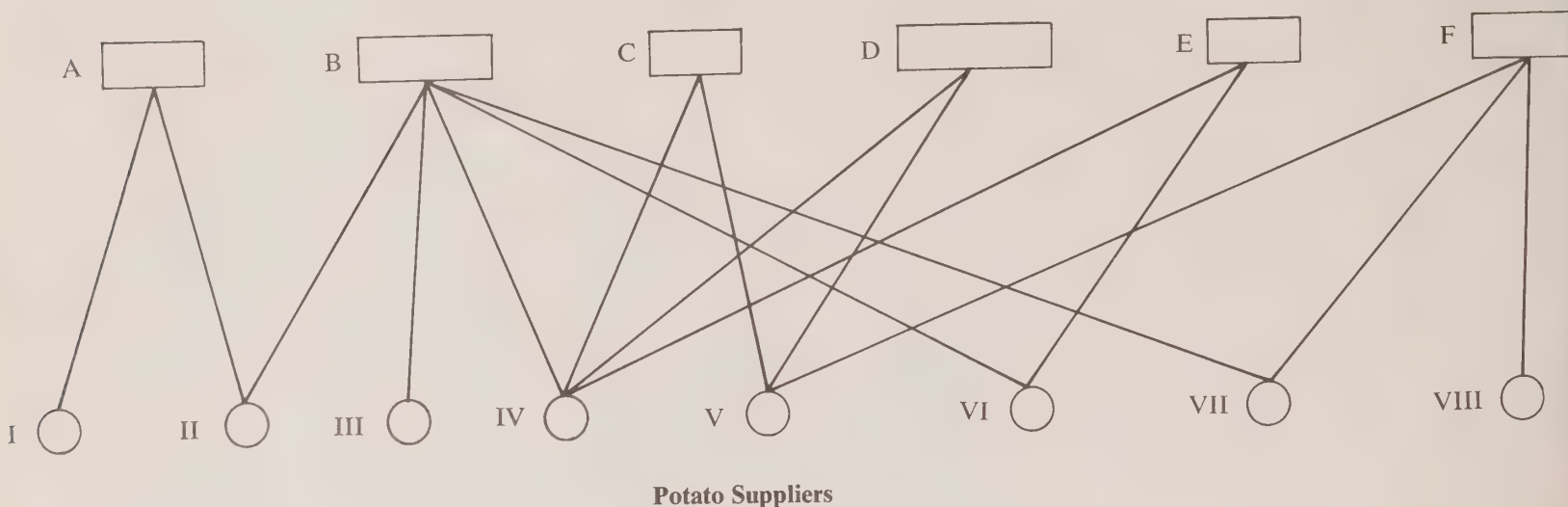
Farm Prices of Middlesex Potatoes (Ontario No. 1)

	1951-1955	1961-1965
	Average \$/cwt.	Average \$/cwt.
January	2.37	2.23
February	2.22	2.32
March	2.31	2.23
April	3.07	2.38
May	3.72	2.17
June	3.38	3.00
July	3.21	n.a.
August	2.77	1.97
September	2.23	1.79
October	2.15	1.84
November	2.38	2.01
December	2.35	2.06

Source: Ontario Department of Agriculture and Food.

MAJOR CORPORATE CHAIN STORES AND THEIR MAIN POTATO SUPPLIERS

Chain Stores



Potato Suppliers

- | | |
|------------------------------------|-----------------------------------|
| I = Manufacturer & Packer | V = Grower (1,000 acres) & Packer |
| II = Grower (1,000 acres) & Packer | VI = Grower & Packer |
| III = Packer | VII = Grower (600 acres) |
| IV = Dealer | VIII = Grower (800 acres) |

protected against the adverse consequences of price fluctuations. They profit as farmers from high potato prices, and when potato prices are low at farm level, they can still obtain some gains as packers of their own and purchased potatoes. Many other farmers have no access to, or connection with, corporate chains. These farmers have to market their produce through these large grower-packers. This situation eventually leads to varying degrees of dependence upon these large grower-packers and, indirectly, upon the chain stores.

Some large, independent growers, with several hundred acres of potatoes, sell high quality, well-graded potatoes directly to wholesalers, institutions and occasionally to chain stores. These growers have invested heavily in machinery, equipment and storage facilities, and are very sensitive to the uncertainties of the market. This group of large-scale independent growers favours collective action: the establishment of a potato marketing board for regulating prices and perhaps even the volume of production.

Another category of grower consists of those who produce both table and processing potatoes. These growers operate well mechanized, relatively large farms of 100 or more acres of potatoes. Partial protection against price fluctuations of table potatoes is provided by processing contracts.²

Smaller potato growers (with less than 100 acres of potatoes) usually tend to be mixed farmers. In general, their potato acreage is too small to allow the economical use of special equipment and modern storage facilities. In the field of marketing, small potato growers are mostly uninformed, unorganized and divided. Many of these growers sell produce which does not meet established grading and quality requirements. Sales are made as quickly as possible, occasionally even straight from the fields. Because of the pressure for ready cash, they are sometimes willing to undersell other growers in the area.

Quality Problems of Ontario Table Potatoes
On the Toronto wholesale market during the 1961 to 1965 period, Prince Edward Island

potatoes obtained an average of 42.6 per cent, and New Brunswick potatoes an average of 30.2 per cent price premium over Ontario produced potatoes. Buyers at all levels show a definite preference for Maritime potatoes.³

The Ontario Division of the Consumer Association of Canada surveyed the opinion of some 100 Toronto housewives concerning Ontario potatoes. In general, the comments centred around the following issues: poor cooking quality of Ontario potatoes, inadequate grading, mechanical injuries and other damages.

Potato experts and the general public express a preference for Maritime potatoes for the following reasons:

Potatoes from New Brunswick, P.E.I. and other provinces are more uniform, since shipments from one province to another require official quality inspection. Intra-provincial potato shipments do not require this type of inspection. Ontario has only three closed areas: Leamington, Niagara and Bradford. Potatoes grown within these areas must

²The number of large-scale potato growers (100 + acres) is estimated at 80-90 in Ontario (seven per cent of total potato growers) with a total potato area of approximately 20,000 acres: i.e., 35 per cent of total potato acreage in the province.

³Canada, Department of Agriculture, Crop and Seasonal Price Summaries.

Seasonal Average Wholesale Prices, Toronto Market, 1951-52 to 1965-66¹

Seasonal Average	Ontario \$/cwt	P.E.I. \$/cwt	N.B. \$/cwt	Premium of P.E.I. Over Ontario	Premium of N.B. Over Ontario	Per Cent of P.E.I. Over Ontario %	Per Cent of N.B. Over Ontario %
1951-52	4.61	5.64	5.24	1.03	0.63	22.3	13.7
1952-53	2.88	3.29	3.41	0.41	0.53	14.2	18.4
1953-54	1.52	1.79	1.68	0.27	0.16	17.8	10.5
1954-55	2.90	3.71	3.41	0.81	0.51	27.9	17.6
1955-56	1.86	3.31	2.65	1.45	0.79	78.0	42.5
1956-57	2.25	2.89	2.55	0.64	0.30	28.4	13.3
1957-58	1.87	2.61	2.54	0.74	0.67	39.6	35.8
1958-59	1.77	2.70	2.43	0.93	0.66	52.5	37.3
1959-60	2.28 ²	4.18	3.77	1.90	1.49	83.3	65.4
1960-61	2.23 ²	2.94	2.73	0.71	0.50	31.8	22.4
1961-62	1.62	2.34	1.92 ³	0.72	0.30	44.4	18.5
1962-63	2.17 ²	2.95	2.56	0.78	0.39	35.9	18.0
1963-64	2.04	3.11	2.84	1.07	0.80	52.5	39.2
1964-65	2.44	4.87	4.58 ³	2.43	2.14	99.6	87.7
1965-66	2.76	3.93	3.60 ³	1.17	0.84	42.4	30.4
Average	2.35	3.35	3.06	1.00	0.71	42.6	30.2

Ontario, Prince Edward Island and New Brunswick number one potatoes.
Few quotations only.

50 lb. bags converted to cwt.

Source: Canada, Department of Agriculture, "Fresh and Processed Fruits
and Vegetables," Crop and Seasonal Price Summaries,

Col. 5 - 1951-52, Part II,

Col. 10 - 1956-57, Part II,

Col. 14 - 1960-61, Part II,

Col. 19 - 1965-66, Part II.

proceed to designated inspection points for
examination before leaving the district.

Some growers pay little attention to quality
considerations; over-fertilization is still fre-
quent and results in higher yield but poor
quality; use of potato harvesters is not too
careful, and consequently leads to mechan-
ical injuries; grading and handling of potatoes
are also inadequate in many cases.

Holland Marsh potatoes, in general, are
unattractive, green easily, and are poor in
cooking quality. Likewise, when Ontario's
new potatoes are harvested in July and
August, they are usually badly skinned, dis-
coloured, wet and soggy by the time they
reach the consumer. The chief produce buyer
of a major chain store offered the following
explanation of consumers' preference for
Maritime potatoes: "the image of Ontario
potatoes has improved to some extent, but
the old and outdated story is repeated so
often by so many people that a negative
situation continues to exist."

The last three or four years, however, have
witnessed some improvements in quality.
Large-scale growers who have invested heav-
ily in potato farming have become interested
in supplying good quality and well-graded
potatoes to their customers, in order to ob-
tain higher prices and better consumer
acceptance.

Chain stores, through their selective pur-
chasing policies of accepting only the highest
grades, have also made a positive contribution
to the improvement of the quality and grading
of Ontario potatoes. Grower-packers, dealers
and brokers now know buying habits and
thus cater to their desires. Those suppliers
who have established a reasonably good
reputation are usually able to maintain con-
tinuing business with chain stores. A certain
quantity of potatoes, however, is still pur-
chased directly from producers by truckers,
and sold to customers without official in-
spection. Potatoes sold on the market without
some form of inspection are the ones which

discredit Ontario potatoes in the eyes of the
public.

Summary and Recent Developments

Potato growers in both Canada and Ontario
have experienced continuing and extreme
price fluctuations. These extreme and irregu-
lar price changes create uncertainty in the
minds of the producer with respect to plan-
ning the following year's production. The
previous year's prices provide little or no
guidance to him. He must guess the most
probable prices for planning purposes, and
these estimated prices may not reflect the
future market situation.

Assessing the probable causes of the ex-
perienced changes in price, it was found
that there were large annual shifts in the
quantity of potato supplies. The fluctuations
in potato quantities have been determined by
two factors:

(a) relatively large and mostly unpredict-
able fluctuations in potato yields per
acre;

(b) year to year changes in potato acreage.

The system of potato marketing has influ-
enced both potato prices and the structure of
the potato growing industry. At present,
Ontario potatoes are sold through two major
marketing channels: fresh market for table
potatoes and contract growing for processing
potatoes.

Contract growing of processing potatoes is
advantageous to both processors and growers
but the situation prevailing in the fresh
potato market is not very helpful to potato
growers. In addition to the problems caused
by the uncertainty of fluctuations in potato
quantity, most growers have to sell on a
market dominated by corporate chain stores.
These chain stores are sufficiently powerful
to influence prices and negotiate transactions
at price levels frequently considered too low
by growers.

The corporate chains handle huge
amounts of potatoes, a significant proportion
of which are purchased from a limited num-
ber of large grower-packers and dealers.
Smaller growers, who have no direct access
to the chain stores, depend to varying degrees
upon the purchases of large grower-packers
and dealers, and ultimately upon the cor-
porate chains. The nature of the market
structure further adds to the gravity of the
problems of the majority of potato growers
who are already seriously affected by the
irregular fluctuations in potato supply.

Potato Marketing Board

Many potato growers in Ontario are convinced that the establishment of a Marketing Board may solve some of their marketing problems. They expect that such a measure would (a) neutralize the consequences of the irregular and unpredictable fluctuations in potato supply; and (b) counteract the economic power of large corporations.

The desired scope of the proposed Marketing Board is still under discussion. The advocates of the idea tentatively agree that the Board should have two committees: a Special Committee, with participation of growers and processors to deal with prices, quality requirements, transportation and terms of payment of processing potatoes; and another committee to deal with table potatoes. The committee for table potatoes would meet at least once a week to establish prices and consider quality and the supply situation. Quality requirements would be strictly enforced and supervision would be obligatory.

At present the bulk of Ontario potatoes is sold by early November. Accordingly, the marketing committee would not control

potato prices during the winter. Potatoes unsold by that time would not be subject to price control, and would be disposed of at the discretion of the individual grower.

The Marketing Board would not introduce a quota system in order to regulate acreage and/or quantity; there would be no provision for an organized potato diversion program to dispose of surplus potatoes. The Board would not assume the role of a marketing agency either; growers would contact purchasers directly.

The advocates of a Marketing Board expect that negotiated prices, if enforced, would reduce insecurity in production, foster orderly marketing, and counteract to a certain extent the oligopsonistic power of corporate chain stores. The assumption is that controlled prices established between July and November will be high enough to compensate growers for their low potato prices during the winter.

However, as experience has shown, erratic fluctuations in the quantity of potato supplies due to fluctuations in yields and planted acreage cannot be eliminated. A situation

may arise in which large quantities of unsold potatoes could exert such a pressure that prices established by the Marketing Board could not be maintained, and the whole marketing system might collapse. Therefore, it is possible that a Marketing Board, if established, might consider measures to consolidate and further improve the economic situation of the growers. Such measures might include the staged introduction of acreage and quantity control and a potato surplus disposal program on a continuing basis.

Although potato growing in Ontario occupies a relatively minor position in the agriculture of the province the problems of potato growers are significant on their own merit since some 1,400 growers and countless consumers are involved. Growers seek to obtain a fair market return for their produce. Consumers desire a continuing supply of high quality potatoes at a reasonable price. By analysing the present market structure of the industry and identifying some of its major characteristics, this study has endeavoured to throw some light on possible solutions.

Selected Economic Indicators

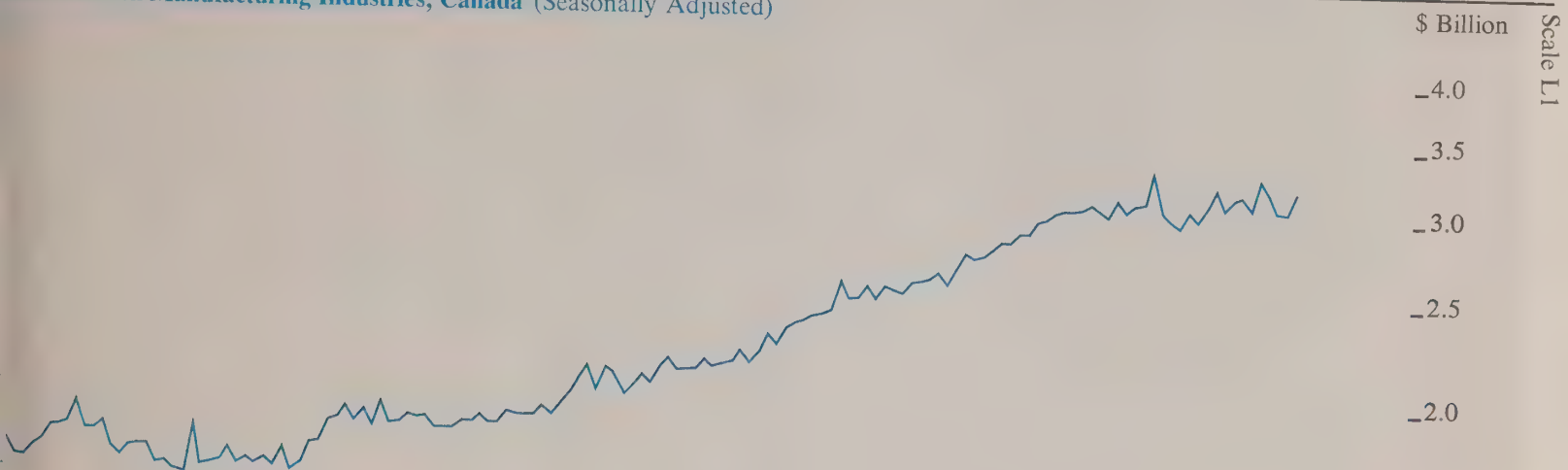
13

Leading Indicators

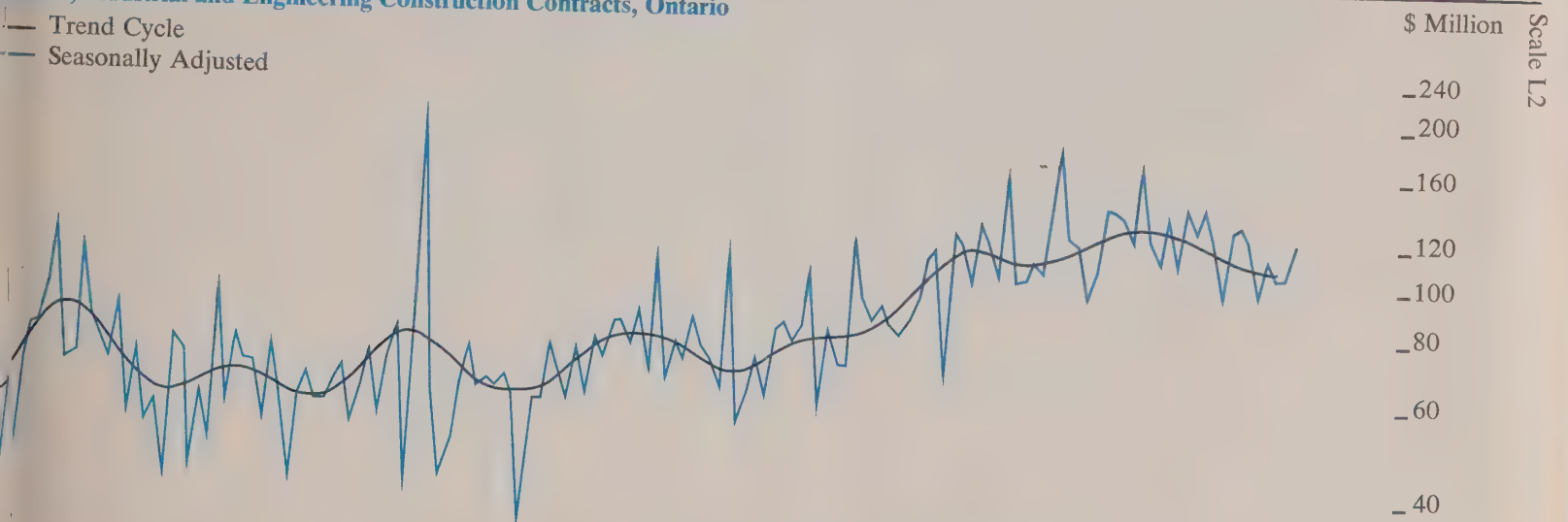
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



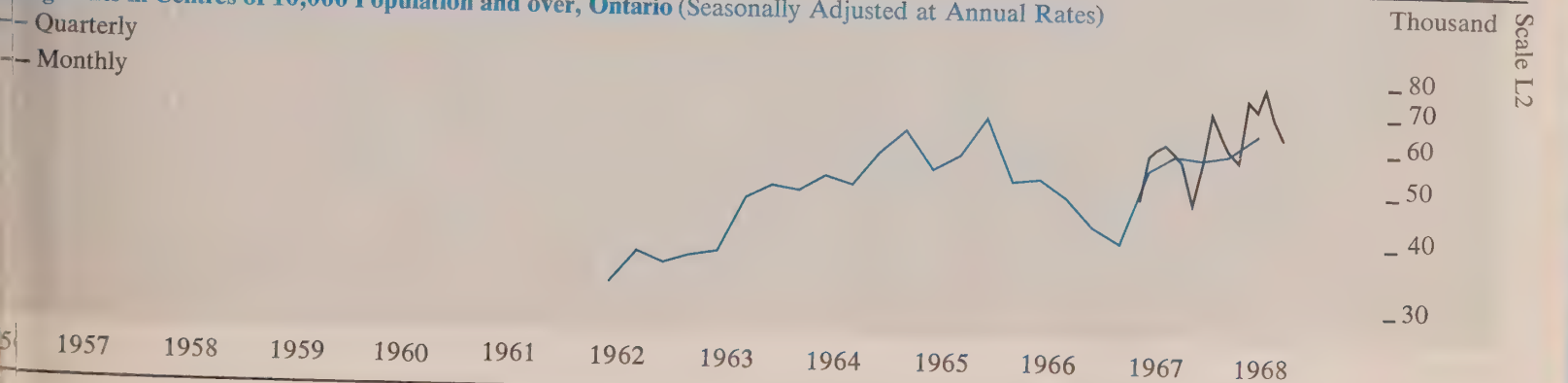
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Business, Industrial and Engineering Construction Contracts, Ontario



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion

_25

_20

_15

_14

_13

_12

Scale L1

Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index

1956 =
100

_160

_140

_120

_100

Scale L2

Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion

— Current Dollars

— Constant (1957) Dollars

_60

_50

_40

_30

Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

\$

_3.00

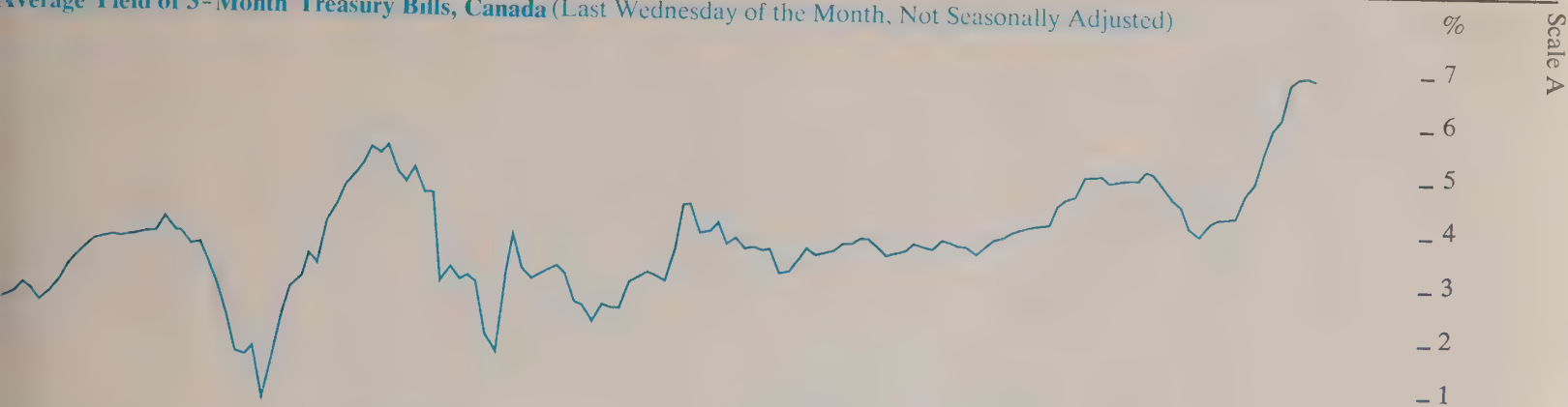
_2.50

_2.00

1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Coincidental and Lagging Indicators

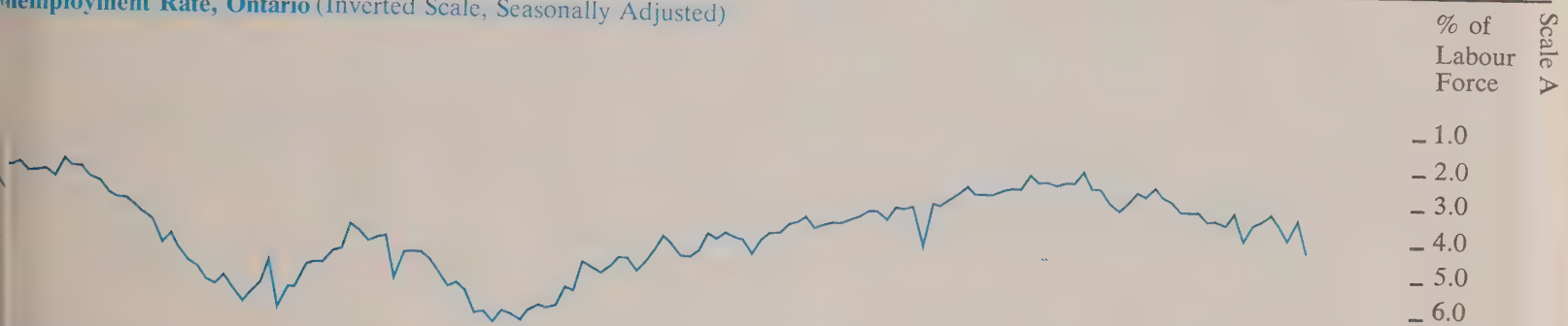
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



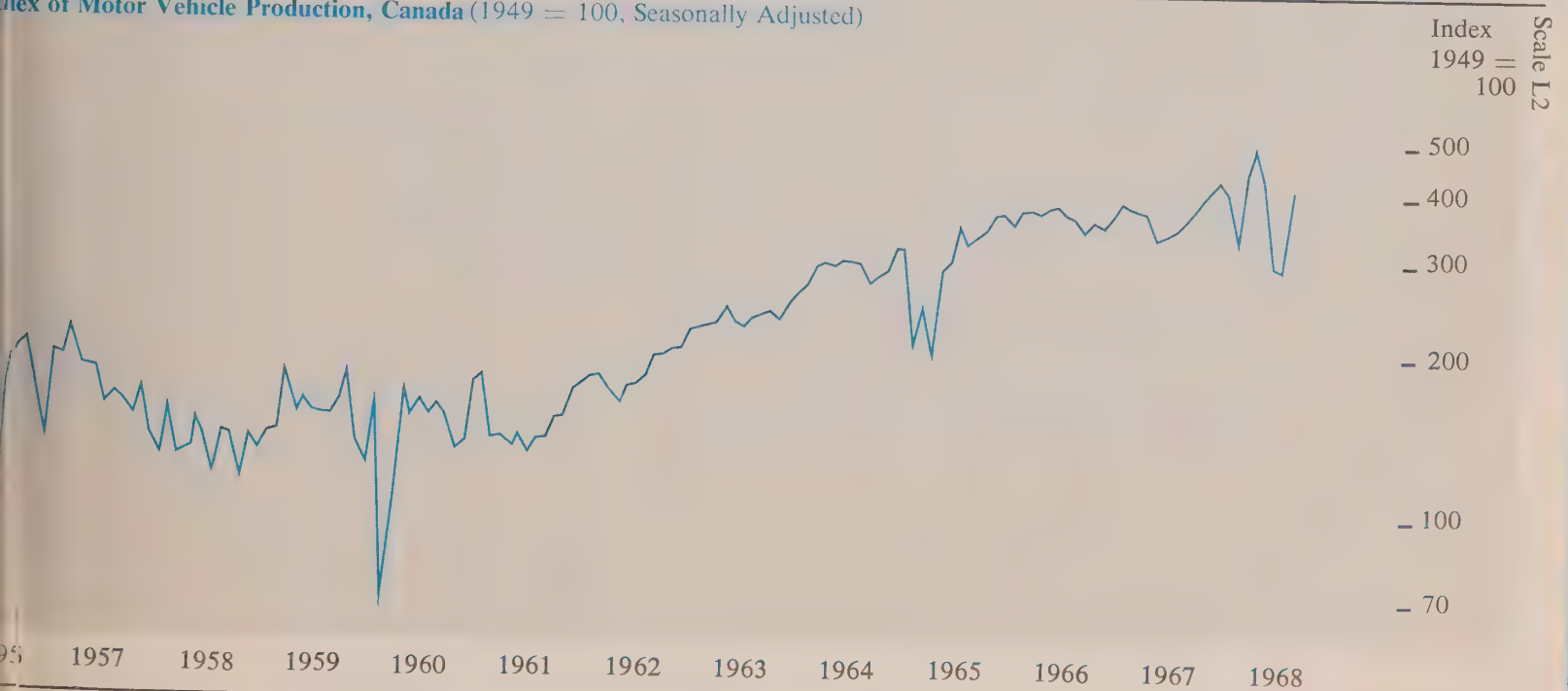
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)



Economic Indicators

Seasonally Adjusted

												1967												1968																				
												April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May																			
Leading Indicators																																												
Average Weekly Hours Worked in Manufacturing												Number	40.2	40.3	40.4	40.5	40.4	40.4	40.4	40.4	40.9	39.9	40.5																					
New Orders in Manufacturing Industries ^e												\$ Million	3,094	3,024	3,117	3,242	3,107	3,161	3,178	3,118	3,308	3,215	3,079	3,078	3,209																			
Business, Industrial and Engineering Construction Contracts												\$ Million	112.9	143.5	129.0	129.3	121.6	99.2	129.7	133.0	125.4	99.3	114.5	105.1	105.4	122.6																		
Urban Housing Starts												Number	62,700	60,100	57,800	48,900	57,500	72,100	66,100	61,000	58,700	76,600	72,700	79,400	69,200	63,200																		
Money Supply												\$ Million	22,307	22,522	22,614	22,797	23,191	23,755	23,839	24,041	24,147	24,149	24,079	24,682	24,972	24,987																		
T.S.E. Industrial Index ^u												1956 = 100	168.28	161.44	164.54	169.66	166.85	168.72	157.39	161.60	162.28	157.43	150.24	146.88	160.43	157.87																		
Business Failures ^u												Number	73	40	59	52	26	34	79	43	73	54	59	87	52																			
Business Failures – Liabilities ^u												\$ Million	2.6	3.3	2.9	3.2	4.1	2.6	16.6	2.9	24.3	2.6	1.8	5.6	6.4																			
Coincidental and Lagging Indicators																																												
Gross National Product ^e (Annual Rate)												\$ Million	62,072								62,372								62,992								64,828							
Average Hourly Earnings in Manufacturing												\$	2.47	2.49	2.51	2.55	2.56	2.56	2.58	2.58	2.60	2.59	2.58	6.98	6.99	6.95																		
3-Month Treasury Bill Rate ^u												%	4.00	4.24	4.28	4.32	4.34	4.76	4.95	5.46	5.95	6.29	6.80	5.313																				
Cheques Cashied in Clearing Centres ¹												\$ Million	5,088	4,964	5,154	5,121	4,983	5,133	5,081	5,459	5,485	5,006	4,959	5,313																				
Retail Trade												\$ Million	720	707	761	728	749	773	757	770	761	789	775	779	2,869	2,890	2,918																	
Labour Force												000's	2,830	2,835	2,844	2,862	2,860	2,851	2,853	2,860	2,856	2,857	2,892	2,869	2,760	2,796	2,796	2,918																
Employed												000's	2,742	2,748	2,750	2,767	2,763	2,762	2,746	2,764	2,762	2,769	2,793	2,760	2,796	2,796	2,918																	
Unemployed												000's	88	87	94	95	97	89	107	96	94	88	99	109	94	122																		
Unemployed as % of Labour Force												%	3.1	3.1	3.3	3.3	3.4	3.1	3.8	3.4	3.3	3.1	3.4	3.8	3.3	4.2																		
Wages and Salaries												\$ Million	1,045	1,051	1,053	1,064	1,071	1,075	1,070	1,086	1,094	1,109.6	1,099.5																					
Index of Industrial Employment												1961 = 100	125.3	124.7	124.4	124.9	124.6	124.6	124.4	125.7	125.8	126.1	124.3																					
Index of Industrial Production ^e												1949 = 100	280.7	280.0	280.8	283.6	284.6	284.3	282.4	289.4	291.0	288.2	285.1	285.3	291.5																			
Total Manufacturing ^e													249.7	246.9	247.3	249.0	250.9	251.7	247.5	256.3	257.1	253.1	248.4	249.1	257.0																			
Non-Durables ^e													244.5	242.7	245.1	243.8	245.0	246.0	246.2	249.0	247.1	247.1	250.0	253.9	255.3																			
Durables ^e													255.7	251.8	249.9	255.2	257.7	258.3	249.0	264.8	268.9	260.2	246.6	243.5	259.0																			
Mining ^e													411.4	415.4	424.2	428.4	426.2	421.9	431.2	425.7	440.7	422.8	435.3	439.6	434.3																			
Electric Power and Gas Utilities ^e													539.1	563.2	555.1	572.9	565.5	555.8	568.0	571.7	572.9	605.9	596.9	583.0	582.1																			
Primary Energy Demand (Annual Rate)												BKWH	50.59	51.86	50.15	51.03	51.80	51.27	52.40	53.80	52.99	55.51	55.34	54.23	54.00	53.81																		
Exports (including re-exports) ^e												\$ Million	971.0	951.3	962.6	914.5	925.2	861.3	956.7	969.4	1,023.0	1,077.7	1,140.4	1,125.7	1,166.7																			
Imports ^e												\$ Million	969.5	911.2	893.5	928.6	900.1	921.8	889.5	882.5	928.7	974.5	1,093.9	970.9	1,033.2																			
Unclassified Indicators																																												
Foreign Exchange Reserves ^{e,u}												U.S. \$ Million	2,188	2,195	2,169	2,183	2,198	2,221	2,303	2,277	2,268	2,175	2,490	2,244	2,416	2,695																		
Industrial Materials Price Index ^{e,u}												1935-39 = 100	252.5	254.6	256.7	253.0	252.0	251.2	250.1	252.9	254.3	253.8	252.4	253.0	251.2	253.9																		
Consumer Price Index ^{e,u}												1949 = 100	147.8	148.1	148.8	150.2	150.9	150.7	150.5	151.0	151.8	152.6	152.7	153.2	154.1	154.2																		

^eStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.





Ontario Economic Review

Government
Publications

July/Aug 1968
Volume 6, Number 4

Department of Treasury and Economics

Hon. Charles S. McNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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The Ontario Economy

Budgetary Constraints to Policy Development

Taxation and Fiscal Policy Branch
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 5, Ontario.

About the Review

The feature article for the July-August edition of the *Ontario Economic Review* is based on Budget Paper B, The Budgetary Framework, contained in the 1968 Annual Budget Statement of the Hon. Charles MacNaughton, Treasurer of Ontario. The article contains an analysis of the framework within which the annual budget is developed, and deals mainly with the growth of its overall financial capacity and the structure of its commitments to existing programs and other agencies.

While the federal government has principal access to the growth-fields of taxation — the personal income tax and the corporation income tax — the tax fields at present available to the provinces — the retail sales tax and the various consumer taxes — have little or no growth potential. Therefore a solution to the problem of the growing burden on the municipal taxpayer will come only with greater access to the progressive tax fields. This goal will be achieved only as a result of total tax-sharing reform among all three levels of government.

The article was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Policy Planning Division of the Department of Treasury and Economics.

Indicator Charts, Pages 12-14

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 12-14 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

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Financial Conditions in the First Half

International Developments

The new year ushered in a period of difficulty for the Canadian dollar in international money markets. The crisis was triggered primarily by the announcement of U.S. Government measures designed to improve the U.S. balance of payments deficit and stem the outflow of gold. Implementation of the program would reduce U.S. investment in Canada by curtailing capital inflows and by requiring Canadian subsidiaries of U.S. corporations to repatriate a greater amount of current earnings to their parent corporations. The significance of the latter requirement for Canadian economic growth and its exchange reserve position can be gauged by the fact that reinvested earnings by Canadian subsidiaries have constituted about 50 per cent of U.S. direct investment in Canada since 1953. The potentially detrimental effect on Canadian foreign exchange reserves is emphasized by the fact that U.S. direct investment in Canada has been a critical element in offsetting Canada's persistent balance of payments deficit with the United States.

The potential instability inherent in these developments induced a sharp sell-off of Canadian dollars in money markets. The Canadian government responded by buying Canadian dollars in the market and by initiating measures to bolster reserves. These measures included recall and standby arrangements for \$426 million in U.S. dollars of gold held at the International Monetary Fund and the activating of "swap" arrangements between the Bank of Canada and the U.S. Federal Reserve Board which realized a further \$250 million in U.S. funds. In addition, the bank rate in Canada was increased from 6 to 7 per cent on January 22nd.

These measures, together with a clarification from the U.S. Administration that its balance-of-payments program was not intended to disrupt present money flows between Canada and the United States, reduced speculative pressure on the Canadian dollar. In return, Canadian authorities gave assurances that they would take steps to ensure that the U.S. guidelines would not be short-circuited by U.S. dollar leakages through Canadian intermediaries to third countries. During January, the spot rate on the Canadian dollar declined to 91.955 cents in terms of U.S. funds. This was dangerously close to the lower level of 91.58 cents permitted under the exchange rate agreement

with the International Monetary Fund. By the end of the month, the value of the Canadian dollar had stabilized at about 92 cents in terms of U.S. funds. It is estimated that about \$350 million in U.S. funds were withdrawn from exchange reserves to defend the Canadian dollar. The official reserves including funds from "swapping" and standby arrangements with the IMF declined from \$2,267 million at the end of December 1967 to \$2,169.3 as of January 31st, 1968 for a net decline of \$97.7 million.

During February and March uncertainty in international monetary conditions served to maintain pressure on the Canadian dollar. Underlying these difficulties was the continued outflow of gold from the United States and fears that the U.S. dollar would have to be devalued. The resulting run on gold forced a temporary suspension on trading in gold by the major gold-holding nations (with the exception of France).

The price of gold on the open market was bid up to approximately \$44 (U.S.) per ounce while the "official" price remained at \$35 (U.S.) per ounce. On March 15 the Bank of Canada raised the bank rate from 7 to 7½ per cent. In addition, Canadian financial intermediaries and corporations were requested by the Minister of Finance (Mitchell Sharp) to curtail their "swap" deposit activities. These transactions involve the depositing of funds with chartered banks for conversion to foreign currency (usually U.S. dollars) in the form of short-term securities. The bank agrees at the time of deposit to reconvert these funds to Canadian dollars at a specified date and price.

The Minister of Finance explained to Parliament on March 18 that the higher 7½ per cent bank rate became necessary because of the increase from 4.5 to 5 per cent of the federal reserve bank discount rate in the United States. He stated at the time that "Canada's action is evidence that Canada intends to maintain the value of the Canadian dollar . . . The purpose is to continue to attract capital into Canada in order to maintain the stability of the Canadian dollar and the Canadian economy."

During the week-end March 15-17, an apparently temporary solution to the international liquidity crisis was formulated when the major gold-holding nations agreed on a two-price system for gold. Under this arrangement, central banks will buy and sell gold at the official price of \$35 (U.S.) an ounce, while the price on the open market

would be free to fluctuate. To date, the system appears to have functioned effectively. At this time, South Africa's policy with regard to marketing new gold is uncertain, but it seems likely that agreement will be reached for orderly marketing which will satisfy both the free and monetary sides of the two-tier market. This possibility is underlined by the fact that there has been a steady decline in the price of gold on the free market and that further supplies exclusively to this market would tend to move open-market prices closer to the official price of \$35 (U.S.) an ounce.

As a result of these adjustments to the international monetary structure, a degree of stability has returned to international monetary markets. The Canadian dollar has shown increasing strength since the crisis in January and during May and June has been valued consistently at about 93 cents in terms of the U.S. dollar. Present signs are that it will push toward the 93.42 cent upper level in terms of the pegged rate.

During the crisis period, the openness of the Canadian economy has been emphasized by efforts to maintain the external value of the Canadian dollar in the face of domestic economic requirements. Although inflationary tendencies in the Canadian economy have aroused concern in recent months, it is doubtful whether a bank rate of 7½ per cent would have been contemplated if the Canadian economy enjoyed some degree of international economic isolation. Initially, the increase from 6 to 7 per cent was interpreted as a temporary measure to stem the run on the Canadian dollar. The even higher rate of 7½ per cent is a classic example of the economic policy conflicts which can develop between external considerations and the needs of domestic economic policy. The improvement in international monetary conditions apparently provided the opportunity for reducing the bank rate to 7 per cent following the federal election of June 25.

The Domestic Capital Market

To a great degree, the domestic capital market has been influenced by international developments. Owing to the relatively high central bank rates of 7 and 7½ per cent between January and June, interest rates throughout the economy experienced an upward adjustment. The rate on 91-day Treasury Bills increased from 5.95 per cent in December to an all-time high of 7 per cent on May 2. The price of longer-term secu-

rities declined significantly. The bell-wether Canada 4½ per cent bonds of 1983 registered their lowest prices on record at about 78 dollars in February and March. By June, both short and longer-term securities reflected easier monetary conditions. On June 28, the average rate on 91-day Treasury Bills declined to 6.56 per cent and the Canada 4½ per cent bonds of 1983 traded at between \$79.50 and \$80.

The day-to-day loan rate recorded an average closing rate of between 5 and 5.60 per cent in the first three weeks of January. Following increases in the bank rate, a general tightening of bank reserves forced this rate to 7.0 per cent by the middle of April. Thereafter, a return to a more liquid position by the chartered banks was reflected in a steady decline in the day money rate. By the end of June the average closing was about 5 per cent.

It was estimated early in the year that the Government of Canada would need to find about \$500 million in new cash before the end of the fiscal year on March 31. Between January and March federal government deposits with the chartered banks increased by about \$387 million. This increase came about primarily through government purchases of Canadian dollars during the foreign exchange crisis. It was anticipated therefore that Ottawa's undertaking to restrain its need for borrowing in the 1968-69 fiscal year would be realized, thus eliminating some of the strains on the capital market experienced in 1967. The need to purchase U.S. dollars to replenish reserves as the Canadian dollar strengthened, and the high rate of "cash-in" of Canada Savings bonds served to keep the federal government active in the capital market. By the end of May, the current value of outstanding Canada Savings Bonds had declined \$569 million from the level reached in last November's sales. The federal government's bank balances which stood at \$258 million were \$556 million below the level recorded at the same time last year. As a result, Government of Canada direct and guaranteed borrowings (carrying terms of over two years) amounted to \$1,577 million between January 1 and June 30. This represents a 133 per cent increase from the \$675 million issued in the same period in 1967. A further \$135 million was raised in bonds having maturity dates of less than two years. In addition, a special treasury bill offering of \$150 million supplemented the normal weekly offering of these securities. New bond

financing as a whole rose 20.1 per cent in the six-month period with provincial and municipal issues down substantially from the same period in 1967. This was presumably a reaction to the relatively high rates of interest prevailing in the period. Corporate issues on the other hand showed a slight increase from \$567.5 million to \$611.3 million in the same period. The federal government in pursuing open-market operations and in replenishing cash balances has, therefore, continued to maintain a high level of occupancy in the capital market.

Both the Canadian and American stock exchanges reacted to the foreign exchange crisis with major sell-offs in February and March. The Toronto Stock Exchange Industrial Index recorded an average closing level of between 160 and 164 in January. By March 21 the closing level had declined to 144.97. There has been a steady improvement since March and the industrial index closed at 166.61 on June 29. In the same period, the Dow-Jones industrial index declined from 899.39 to 825.13 and recovered to 895.28 at the end of the period. Concern is still being expressed at the extent to which Canadian Mutual and Pension Funds are investing in American stocks. There is, however, a tendency to look at the outflow of Canadian funds rather than the net trading position by Canadians in U.S. stocks. The Toronto Stock Exchange Review of May reports that in 1967 \$1.8 billion of common stocks were purchased from U.S. sellers while \$1.6 billion were sold to U.S. purchasers. The net outflow was therefore about \$199 million. It has been argued by the managers of these funds that a primary reason for purchases in the U.S. market is that certain high growth equities particularly in electronics and airlines are not available in Canada and that a sufficient supply of top quality Canadian equities is not always available to them.

The scope and form of the more recent Bank of Canada open market operations reflect a movement toward lower rates of interest in the economy. The ability to sustain a policy of "easier" money will probably require continued fiscal restraint by all levels of government. The recent imposition in the United States of a 10 per cent tax surcharge together with \$6 billion in expenditure cuts will probably be a useful supplement to Canadian policy objectives. The lower interest rates which may now be expected in the United States should give Canadian

monetary authorities some leverage to influence interest rates in Canada in a manner consistent with domestic economic conditions.

The Consumer Price Index in the First Half

The Canadian Consumer Price Index (base on 1949=100) rose by 0.3 per cent from 154.2 at the beginning of May to 154.7 at the beginning of June. All major components of the general index—food, housing, clothing, transportation and health and personal care—moved higher. Only the group index covering recreation and reading material and tobacco and alcohol remained unchanged from the previous month.

Although the index was 4.0 per cent above its level of 148.8 recorded in June 1967 there are indications the rate of increase in living costs has been lessening. Earlier this year the annual increases have been consistently higher with the March 1968 index 4.6 per cent above the level recorded twelve months earlier.

The June food price index was 149.1, compared with 148.9 in May and 144.8 in June of last year. The Dominion Bureau of Statistics reports that beef prices, which have been dropping for the past seven months, increased in June, and higher prices also prevailed for bacon, ham, chicken and fish. Among staple items, milk and bread prices increased in several cities, whereas butter and eggs declined.

The housing index rose to 157.6 from 157.1, mainly because of higher rents. The largest rent increases were registered in Montreal, Ottawa, Calgary and Halifax. The 0.9 per cent advance in rents reflects the fact that many occupants of rental accommodations sign new leases at this time of year.

DBS reports that other major increases occurred in the prices of men's and children's wear, footwear, piece goods, and clothing services. Higher inter-city train and bus fares for the summer season contributed to the increase in transportation costs while automobile operation costs remained unchanged as higher gasoline prices and service offset a fractional decline in the price of new automobiles.

The increase in the index of health and personal care prices was 0.1 per cent to 197.9 in June from 197.8 in May and 3 per cent above its level in June 1967.

There is no index of average family incomes comparable to the index of consumer prices, but the DBS industrial composi-

index of average weekly wages and salaries (based on 1961=100) rose in April to 139.3 from 137.5 in March and 130.8 in April of 1967. In the twelve months to April of this year, average weekly wages and salaries rose by more than 6.5 per cent. In the same period, the consumer price index rose to 154.1 from 147.8, an increase of 4.3 per cent. DBS announced earlier that its preliminary estimates for May indicate that average weekly wages in manufacturing rose to \$104.49 from \$104.26 in April, and 100.63 in March.

The Consumer Price Index, calculated each month by the Dominion Bureau of Statistics, is designed to measure the price level of selected consumer goods. This is achieved by measuring the percentage change over time in the cost of obtaining a fixed "basket" of commodities and services, representing the

purchases made by a cross-section of consumers in a specified time period. At present, the particular population group considered consists of families which in 1957 lived in Canadian cities of over 30,000 population, ranged in size from two adults to two adults and four children and had annual incomes ranging from \$2,500 to \$7,000 during the survey year. The price index covers about 300 different goods and services.

The bureau is at present working on a new consumer price index to be based on 1961. The present index measures changes since 1949 in the current prices of the items included in the basket of goods and services. The relative importance attached to each was determined by the results of a sample survey of family expenditures carried out in 1957. Obviously not everything purchased

by the survey families in the base year can be included in the basket since this would make the problem of collecting prices exceedingly difficult. Therefore the items priced for the index are only a sample, albeit a large one, of the things families buy. They are chosen to be representative of all items and the relative weight given to any item is based not only on the purchase value but also on the value for similar or related goods and services which are not included in the basket.

Costs of shelter and household operation make up the housing index, which accounts for 32 per cent of the total index. Food prices account for 28 per cent, clothing for 11, transportation for 12, health and personal care for seven, recreation and reading for five, and tobacco and alcohol for six per cent.

The Consumer Price Index, 1968

	Monthly Index (1949=100)						Per Cent Change from One Year Ago					
	Jan.	Feb.	Mar.	April	May	June	Jan.	Feb.	Mar.	April	May	June
All Items	152.6	152.7	153.2	154.1	154.2	154.7	4.5	4.5	4.6	4.3	4.1	4.0
Food	150.4	149.8	148.7	149.8	148.9	149.4	3.8	4.0	3.8	4.0	3.6	3.2
Housing	154.7	155.4	156.0	156.6	157.1	157.6	4.8	5.2	5.1	4.3	4.4	4.2
Clothing	133.4	134.0	135.6	136.3	135.8	136.4	3.7	3.8	3.7	3.3	3.0	2.9
Transportation	160.0	159.2	160.3	160.8	161.0	161.8	4.6	2.7	3.0	2.4	2.4	2.3
Health and Personal Care	193.6	194.3	194.3	197.0	197.8	197.9	4.7	5.0	4.9	3.7	3.6	3.8
Recreation and Reading	170.2	171.8	172.5	172.1	174.2	174.2	4.1	5.0	5.4	4.8	4.6	4.2
Tobacco and Alcohol	136.3	136.4	138.4	140.9	141.1	141.1	7.7	7.6	8.5	10.3	10.3	10.1

Source: DBS, Price Movements.

Budgetary Constraints to Policy Development

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This article contains a discussion of the framework within which annual budgetary decisions are made and new policies developed. In particular, attention is given to the nature and implications of two constraints to the government's ability to respond to increasing and changing demands for public services and facilities. The first constraint is the capacity of existing tax sources to finance required increases in total expenditures. The second constraint is the difficulty of undertaking radical changes in the structure of established and continuing government programs in any one year.

THE REVENUE CONSTRAINT TO GROWTH

In recent years it has become apparent that provincial and municipal revenues do not have the growth and capacity to meet rapid increases in required expenditures.

Growth of Government Revenues Versus Expenditures

The problem of unbalanced expenditure-revenue growth has been extensively documented in two main studies. First, in preparation for the re-negotiation of federal-provincial financial arrangements in 1966, the Tax Structure Committee (TSC) undertook a comparative analysis of the anticipated growth of federal and provincial-municipal expenditures and revenues for the period 1966-67 to 1971-72. The result of these projections was that, on the basis of then-existing governmental expenditure programs and tax sources, the combined deficit for all three levels of government would increase during this period. The estimated combined government deficit of \$0.9 billion for 1966-67 was projected to increase to \$2.1 billion in 1971-72 on the basis of an annual Gross National Product growth rate of 6 per cent over the period, or to \$1.4 billion if GNP increased by 7 per cent a year.¹

The most significant finding of the TSC study, however, concerned the distribution of the total governmental deficit between the federal and provincial-municipal sectors. At the 6 and 7 per cent levels of annual GNP growth, total provincial-municipal deficits were projected to reach \$2.4 and \$2.1 billion respectively by 1971-72. In contrast to this pattern of mounting provincial-municipal deficits, the federal government was expected to record surpluses throughout the period increasing to \$0.3 and \$0.7 billion at the 6

and 7 per cent levels of annual GNP growth.

This first view of the imbalance of provincial-municipal expenditure and revenue growth was confirmed by similar projections undertaken by the Ontario Committee on Taxation (Smith Committee) and published in 1967.² The Committee's projections indicated that anticipated combined provincial and local government budgetary deficits in Ontario would increase from about \$116 million in 1967 to over \$1 billion in 1975. Over the same period, the study indicated that the provincial government's own budgetary deficit could be expected to increase from \$81 million in 1967 to about \$900 million in 1975.³

It should be emphasized that the TSC and Smith Committee projections cannot be used as definitive quantitative measures of the exact course of expenditure-revenue growth. The obvious difficulty in anticipating future conditions meant that the projections inevitably took the form of extrapolations of past

and then-current government operations and economic conditions, modified by certain assumptions concerning the likely behaviour of such key factors as economic growth rates, population changes and price increases.

Interim developments have already rendered these projections partially obsolete. The development of new government programs, greater-than-expected price increases and higher rates of economic growth have caused both expenditures and revenues to increase faster than was originally anticipated. While it is not possible to measure accurately the absolute effects of interim changes, they are unlikely to alter significantly the relative growth of expenditure and revenues. In other words, it can be generally assumed that the TSC and Smith Committee were correct in predicting a continued imbalance in expenditure-revenue growth resulting in greater budgetary deficit at the provincial-municipal level during the foreseeable future.

Table 1
Summary of Ontario Government Expenditure and Growth Rates, 1958-59 to 1967-68

	Average Compound Annual Growth Rate		
	1958-59 to 1963-64	1963-64 to 1967-68	1958-59 to 1967-68
	Per Cent	Per Cent	Per Cent
A. Total Net General Expenditure	9.5	18.6	13.4
B. Actual Revenue			
Total Net General Revenue	10.9	18.0	14.0
Personal Income Tax	12.8	35.2 ¹	22.3 ¹
Retail Sales Tax	—	23.6 ²	—
Corporation Tax	5.7	9.4	7.3
Gasoline Tax	4.7	11.1	7.5
C. Revenue on Basis of 1967-68 Tax Package and Rates throughout Period			
Total Net General Revenue	6.0	10.3	7.9
Personal Income Tax	8.5	19.4	13.2
Retail Sales Tax	5.6	8.8	7.0
Corporation Tax	5.6	7.2	6.3
Gasoline Tax	4.7	5.5	5.1
D. Revenue on Basis of 1958-59 Tax Package and Rates throughout Period			
Total Net General Revenue	5.3	10.0	7.4
Component sources will have identical growth rates to those shown under C, as only the 'tax mix' will alter the growth rates of total revenue.			
E. Provincial Domestic Product	5.3	9.2	7.0

¹Reflects increases in federal abatements of the personal income tax field in stages from 17 points in 1963-64 to 28 points in 1967-68, where the total yield of income tax for each year is taken as 100 points.

²A retail sales tax of 3 per cent was introduced in Ontario in 1961 and was increased to 5 per cent in 1966.

¹Report of the Tax Structure Committee to the Federal-Provincial Conference: Projections of Government Revenues and Expenditures, October 28, 1966.

²Report of the Ontario Committee on Taxation, 3 vols. (Toronto: Queen's Printer, 1967).

³These figures exclude advances through the Ontario Universities Capital Aid Corporation which were included in the original Smith Committee projections.

Table 2 — Net Capital Debt and Provincial Domestic Product, 1963 to 1967

	1962-63	1963-64	1964-65	1965-66	1966-67
	\$ Million				
Net Capital Debt at Year End	1,284	1,345	1,365	1,381	1,360
Provincial Domestic Product	14,605	15,600	17,000	18,700	20,500
N.C.D. as % of PDP	8.8	8.6	8.0	7.4	6.6
Theoretical Limit of N.C.D. per Smith Committee (9% of PDP)	1,314	1,404	1,530	1,683	1,845
Favourable Difference between actual and theoretical Net Capital Debt	30	59	165	302	485

The 'Tax Mix'

The basic reason for expected increases in provincial-municipal deficits is that, compared with the growth of required government expenditures, total revenues tend to grow more sluggishly because of the relatively heavy reliance of these two levels of government on low-growth tax sources.

This problem may be illustrated by experience over the five-year period 1963-64 to 1967-68. Table 1 shows that during this period total provincial expenditures and revenues increased at an average annual rate of about 18.6 and 18 per cent respectively. However, it is significant that revenues increased in line with expenditures only as a result of sizable increases in provincial tax capacity. The most important of these were the staged increases in federal abatements of the personal income tax field from 11 points in 1963-64 to 28 points in 1967-68. These increased abatements had the effect of increasing the annual average growth rate of provincial income tax revenues during this period to 35 per cent compared with 19 per cent which would otherwise have prevailed. Similarly, the increase in the provincial retail sales tax rate from 3 to 5 per cent in 1966 had the effect of increasing the annual average growth rate of sales tax revenues from 9 to 24 per cent over the five-year period. The result of these tax changes during the period brought the total average annual growth rate of provincial revenues to 18 per cent, compared to a rate of about 10 per cent that would have prevailed without major tax changes during the period.

Two observations are relevant concerning the future growth of provincial revenues. First, it is important to distinguish clearly between the immediate impact of tax changes on revenue flows and subsequent longer-term revenue growth. The tax changes detailed above created a marked upsurge in provincial revenues. But without further and similar changes in tax capacity, government revenues will now increase only as a function of the growth of taxable income and activities. In other words, on the basis of economic growth rates over the past five years, the annual growth rate of personal income tax receipts would settle down to a rate of about 19 per cent, with the growth in total provincial revenues returning to about 10 per cent.

The second observation concerns the critical connection between economic growth and revenue growth. During the past five years, Canada has experienced high and sustained rates of economic growth, which in terms of longer historical perspective may not continue unabated for an indefinite period. For example, while Provincial Domestic Product (PDP) has increased at an annual average rate of 9.2 per cent in the 1963-67 period, the average annual growth rate for the earlier 1958-64 period was only 5.3 per cent. Thus any reduction in the rate of economic growth will be immediately reflected in lower rates of revenue growth. This is particularly so with personal and corporate income tax revenues, both of which are highly sensitive to changing economic conditions.

Financing Alternatives

The review of the provincial 'tax mix' indicates that a continuation of past expenditure

growth rates will produce significant increases in provincial-municipal deficits in general conformity with the TSC and Smith Committee projections.

While it is expected that there will be a decline in expenditure growth rates from the unusually high levels recorded in recent years, it is questionable whether it will be possible to reduce them by the amount necessary to bring them neatly in line with the growth capacity of now-existing total revenue sources.⁴ This question in turn raises the problem of how such deficits can be financed either by increases in tax capacity or by borrowing.

Debt Financing

As the Smith Committee pointed out, there are limits to the province's debt capacity if one of the objectives of the province is a high credit rating based on prudent finance. The Smith Committee defines the limit to the province's net debt capacity as 9 per cent of the Provincial Domestic Product. While this level need not necessarily be accepted as irrevocable and definitive, it may be used for present purposes as a convenient benchmark in examining the general scope for future increases in debt operations.

Table 2 shows that, while the 9 per cent ratio was almost reached in the early sixties, it was reduced to about 6.6 per cent at the end of the 1966-67 fiscal year. According to Smith's definition, the province's net capital debt capacity theoretically stood at \$1.8 billion at the end of 1966-67 and exceeded the actual level of net capital debt by 2.4 per cent of PDP or almost \$500 million. This may appear to leave a good margin for debt expansion, but in the face of anticipated expenditure pressures and Smith-projected deficits, this slack would be eliminated fairly quickly. Once the debt to PDP relationship has again reached the limit of 9 per cent, the annual additions to the net capital debt would be severely curtailed and geared to whatever growth is realized in PDP.

If the province were, for example, already at its debt limit at this time, the maximum tolerable increase in the net capital debt during 1968-69 would be about \$140 million (Table 3). Assuming a long-term average growth rate in PDP of 7 per cent, the tolerable annual additions to the net capital debt would slowly rise to \$170 million in 1971-72 and \$210 million in 1974-75. These con-

⁴The introduction of program budgeting as a means for reducing expenditure growth by increasing the efficiency and effectiveness of programs is discussed in the last section of this paper.

straints would compare with the increase in net capital debt, projected by the Smith Committee, of \$538 million in 1971-72 and \$897 million in 1974-75.⁵

On the assumption that there will be no further tax increases and that the province will be able to keep deficits down to those projected by the Smith Committee, the previously indicated leeway of \$500 million would disappear in 1970-71. During the latter year, net capital debt would reach 9 per cent of PDP. However, given the fact that the province has already introduced the basic shelter tax exemption and assumed the cost of the administration of justice,⁶ this critical point will be brought forward by one full year.

Table 3 makes a tentative evaluation of the amount and possible form of additional taxation that would be required to maintain the net capital debt at 9 per cent of PDP. Even if 12 additional points of the personal income tax were introduced in 1969-70, they would be inadequate as early as 1971-72. Allowing the net capital debt ratio to rise to 10 per cent of PDP would result in a tolerable debt by 1974-75 of \$3,564 million instead of \$3,208 million. Such a condition would make 12 additional points of the personal income tax, if introduced in 1969-70, just adequate.

There is one important reason why the actual path of debt financing will differ from the one projected in Table 3. The table suggests a relatively rapid build-up of the net capital debt, involving levels of debt financing

in the early years considerably in excess of what would be considered acceptable by current standards of prudence, good credit ratings and capital market accessibility. This further strengthens the point that the timing of required tax increases must be brought forward.

Increased Tax Capacity

The limits to debt increases demonstrate that a large part of future deficits must be financed by increases in provincial tax capacity. This need involves two interrelated problems. The first concerns the type of increased tax capacity required. The second problem relates to how required increases in tax capacity should be achieved.

High Versus Low Growth Tax Fields

The overriding factor to be considered in securing increased tax capacity is the 'natural' growth potential of the yields of different tax sources. Reference has already been made to the inadequacy of the province's tax mix in terms of its relatively heavy reliance on low growth fields. Consequently, if the composite growth rate of total provincial revenues is to be improved, it will be necessary to increase the relative use of those tax fields which display high growth characteristics.

The relative growth of the Ontario Government's main tax sources is described in Table 1. The most significant feature of this comparison is the high growth capacity of personal income tax yields compared with that of other sources. In short, as the Smith Committee has emphasized, increased use

of the personal income tax field by the province should feature as a significant part of any general move towards increased tax capacity.

Independent Provincial Versus Joint Federal-Provincial Tax Changes

In general terms, increased provincial tax capacity may be secured in two main ways.

The first method is commonly referred to as independent taxing and would involve Ontario changing the use of its own tax fields without reference to federal or other provinces' taxes. The main problem inherent in independent taxing is the possibility of creating inter-provincial disparities in tax levels which may, in turn, adversely affect the competitiveness or distribution of regional economic activity. With respect to the personal income tax field, for example, any increase in Ontario rates would not only have the effect of raising the absolute level of such taxation in Ontario, but could also have the effect of penalizing income-generating activity in Ontario disproportionately to that in other provinces. A similar problem would, of course, be implicit in any increase in Ontario corporate income tax rates above those in other provinces. In general terms, then, there are clearly limits to any province's independent ability to raise taxes.

The second method of securing increased provincial tax capacity is through combined federal-provincial action in jointly occupying tax fields. This question, in turn, has two main aspects.

Table 3 — The Implications of the Smith Committee's Debt Constraints

	1967-68	1968-69	1969-70	1970-71	1971-72	1974-75
	\$ Million					
Projected "Tolerable" Net Capital Debt, at 9% of PDP at year ends	2,000	2,138	2,287	2,447	2,619	3,208
Net Capital Debt, actual (67-68) and as projected by Smith, and including cost of Basic Shelter Tax Exemption and Administration of Justice ²	1,538	1,989	2,534	3,165	3,925	7,005
Projected Net Capital Debt in excess of "tolerable" limit per Smith	—	—	247	718	1,306	3,797
Projected Cumulative Value of 12 additional points of Personal Income Tax if introduced in 1969-70 ³	—	—	319	686	1,108	2,793
Projected N.C.D. in excess of "tolerable" limit after additional 12 points of P.I.T.	—	—	—	32	198	1,004
Additional Annual Revenue required to maintain N.C.D. at 9% of PDP	—	—	—	32	166	325

¹For brevity, the years 1972-73 and 1973-74 are omitted.

²The Smith Committee's projections of increases in actual net capital debt to 1974-75 are:

(a) Reduced by estimated advances through the Ontario Universities Capital Aid Corporation, which were included in Smith's calculations. See Smith Report, Vol. 1, p. 214.

(b) Then increased for the estimated costs of the basic shelter tax exemption and administration of justice, because in projecting provincial deficits the Smith Committee did not allow for the cost of the various recommendations of their report. Thus, the annual additions to the net capital debt cited in the preceding page for 1971-72 and 1974-75 of \$538 million and \$897 million are increased in the table to \$760 million and \$1,177 million respectively.

³The Smith Committee suggests a staging of additional personal income taxation reaching 8 points in 1968-69, 10 points in 1971-72 and 12 points in 1974-75.

⁵See footnotes to Table 3.

⁶These were two of the major recommendations of the Smith Committee.

First, where the total level of combined governmental taxation in Canada is inadequate to finance properly the required growth of combined government expenditures, there could be an orderly and comprehensive change in the national tax structure. Federal and provincial tax committees have recently undertaken extensive studies of the existing tax systems. The general conclusion of these reports is that there is an urgent need to develop a new tax system that will raise the funds required for public expenditures in an equitable and economically efficient manner. While there is agreement on the importance of tax reform, relatively little attention has as far been given to the co-ordination of reforms at the federal and provincial-municipal levels. Consequently, there is a need for tax reform with proper recognition of the role of all taxes in a national tax structure, irrespective of whether tax fields are levied exclusively or jointly by different levels of government.

The second aspect of joint federal-provincial tax changes relates to the proper distribution of tax capacity between the two levels of government. In other words, apart from the general adequacy of tax revenues in a national governmental sense, each level of government must be given the tax occupancies necessary to finance its responsibilities. In this connection, reference has already been made to the 1966 Tax Structure Committee projections which clearly demonstrate the need for a significant transfer of tax capacity from the federal to the provincial level to match the distribution of projected budgetary deficits.

Public Finance and Fiscal Policy

Finally, in considering the need for a reallocation of tax resources, attention must be given to two other important factors.

The first concerns the federal government's ability to regulate economic activity through tax changes. The Ontario Government's views on how the requirements of efficient public finance and fiscal policy can be reconciled were developed in detail during the technical discussions surrounding the negotiations in 1966 and have been publicly expressed in various statements.⁷

Briefly, it is believed that this goal can be achieved through the development of tax agreements to cover a central package of shared tax fields. This would allow the federal government to use a number of economically significant taxes in concerted fashion to

achieve policy objectives, without fear of countermanding provincial actions. The revenues from this tax system could then be divided between the two levels of government according to their relative expenditure requirements.

The second major consideration concerns the need for balanced growth of the public and private sectors of the economy. This involves the containment of total governmental expenditures within the limits of tolerable levels of taxation and government borrowing. Basic to this is the need for all levels of government in Canada to co-ordinate their expenditures within a commonly agreed system of policy objectives and priorities.

In this connection, encouraging steps have already been taken. At the January meeting of the Ministers of Finance there occurred, for the first time, an extensive discussion of the budgetary plans and problems of the participating governments. These initial exchanges resulted in a common agreement that there is an urgent need to develop effective mechanisms for more rigorous and continued consultation. Such a system should, first, permit the federal government to take fuller account of provincial operations in determining Canada-wide fiscal policy. Second, it should allow provincial policies to be more effectively developed in the context of national patterns.⁸ Third, it should provide an objective basis for allocating limited tax resources to allow governments to meet recognized priorities.

CONSTRAINTS TO EXPENDITURE FLEXIBILITY

The second component of the annual budgetary framework concerns the government's ability to meet new expenditure demands within the overall limits set by the revenue growth and borrowing capacity. The main constraint to manoeuvrability in this sense is the need to provide for the orderly continuation and growth of established programs. In any given year, a significant proportion of government revenues is thus effectively pre-empted, leaving only a relatively small part to be applied to new priorities. This means that, in a very real sense, priority-setting is an evolutionary process in which new programs are steadily built up and other programs phased out or de-emphasized over the course of several budgets.

The Structure of Government Expenditures

A useful insight into the relative inflexibility of provincial expenditures at any given time

can be gained from Table 4. This table sketches the structure of government spending in terms of the administrative operations of departments as well as financial commitments to other governments, agencies and individuals.

A number of observations may be made on the flexibility constraints of various components of total expenditure. First, the government's own operations in the form of departmental expenditures are a relatively small part of the total. The civil service overhead (category A in Table 4) accounts for only 20 per cent of the total, with about 12 per cent in the form of wages and salaries. Insofar as the civil service represents the central core of government operations generally, reductions would run the obvious danger of reducing the effectiveness of existing programs and administrative controls. However, it is a continuing goal to keep the growth in this category to a minimum consistent with required efficiencies. Not all wages and salaries are included in this category. For example, a substantial part of highway maintenance, which is another relatively inflexible type of expenditure (shown under category F), consists of salaries and wages. Other expenditures incorporating salaries and wages are highway and public works construction.

Departmental capital expenditures on physical assets (category E) represent the provision of essential social capital, of which roads form the major component. These capital expenditures, though essential, are often considered partly flexible in terms of their timing and in the manner in which they are financed. On the latter aspect, depending on the overall fiscal policy requirements of the time, a smaller or larger proportion of these expenditures will usually be financed out of ordinary revenues.⁹

Perhaps the most significant feature of Table 4 is the high proportion of total expenditures allocated to the financial support of local governments, school boards and agencies. The most confining aspect of these payments, making them the least flexible in principle, is the fact that they are primarily statutory or contractual commitments, in large part based on expenditure decisions made at the local level. For instance, the legislative grants to school boards, accounting for some 21 per cent of total budgetary spending, are based on a formula. This formula is regularly revised to ensure that provincial support of rapidly rising school board

⁷See particularly the Statement by the Prime Minister of Ontario to the Federal-Provincial Tax Structure Committee in September 1966; and the Ontario Treasurer's Statement to the Meeting of Ministers of Finance, January 1968.

⁸For a fuller discussion of provincial fiscal policy, see C. L. Barber, *Theory of Fiscal Policy as Applied to a Province, Ontario, Committee on Taxation* (Toronto: Queen's Printer, 1968).

⁹That is, with more or less debt financing according to the need to stimulate total economic activity.

expenditures is maintained at a sufficiently high level. The Ontario Government has entered these commitments in recognition of local financial constraints and the need to ensure essential expenditures for the maintenance and growth of local services and educational capacity. The expenditures within the relatively inflexible category B commit almost 40 per cent of the provincial budget. In addition, the provincial government has equally strong commitments to assist in financing higher education. The universities depend on the government for the largest part of their very large and rapidly rising expenditures. In addition, the Colleges of Applied Arts and Technology (CAATS) are entering a phase of rapid expansion and greatly increased cost which will have to be assumed by the government. Entered under category D in the table, these costs already account for 10 per cent of the budget and can be expected to absorb a growing proportion in the near future.

The temporary build-up of Canada Pension Plan Funds has enabled the government to make loans and advances to school boards and universities to cope with their tremendous capital expansion requirements. This procedure has, in fact, proven to be vastly more efficient and economical than a situation in which the school boards would have been forced to do their own borrowing in the capital market. As shown in Table 4, some \$280 million was made available this way during 1967-68.

Table 4, therefore, clearly illustrates the many rigid factors that play a dominant role in the provincial budget. This is not to suggest that the province lacks discretionary powers in these areas, but only that the government has accepted these persistent rigidities and growth areas in its budget in recognition of the essential needs behind each of these programs. Any reduction or even stabilization of total support under programs of this nature would presumably result in higher property taxes and inadequate services at the local level as well as in the universities. Curtailment of support for the latter would probably make university training available to fewer eligible students.

The Growth of Expenditures

Table 4 provides a useful cross-section of the provincial expenditure structure in 1967-68. But there is another and more dynamic aspect to the government's commitments to established priorities. This concerns the

Table 5 — Annual Percentage Rate of Change in Enrolment in Ontario Elementary and Secondary Schools, CAATS and Universities¹

Year	Elementary	Secondary	CAATS		University Full-Time		
			Minimal	Probable	Under-graduate	Graduate	Total
1966-67	3.7	8.6	21.3	21.3	16.8	12.7	16.3
1967-68	2.1	3.0	62.7	62.7	13.9	26.6	15.3
Projections							
1968-69	2.0	2.7	28.6	69.8	10.2	17.6	11.1
1969-70	1.3	1.6	23.6	30.3	7.5	13.9	8.3
1970-71	0.8	1.2	7.8	25.1	6.5	11.5	7.1
1971-72	-0.4	0.2	7.2	20.4	5.6	9.6	6.2
1972-73	-0.1	0.4	6.7	17.7	5.2	8.1	5.6
1973-74	-0.3	0.3	5.5	14.8	5.0	7.5	5.4
1974-75	-0.4	0.3	5.2	13.5	2.0	5.9	2.6
1975-76	-0.5	0.2	4.7	11.4	1.6	5.6	2.3

¹The enrolment ratios used in calculating the rates of increases in enrolments for the various education levels are as follows: elementary schools at 93.6 per cent of the 5 to 14 year age group; secondary schools at 73 per cent of the 15 to 19 age group; CAATS, at minimum rising from 5.5 per cent of the 18 to 20 age group in 1968 to 10 per cent in 1976, or probably rising from 5.5 per cent in 1968 to the higher ratio of 25 per cent in 1976; university undergraduate rising from 15.1 per cent of the 18 to 21 year age group in 1967-68 to 18 per cent in 1975-76; and university postgraduate enrolment rising from 16.1 per cent of the three-year moving average of undergraduates in 1967-68 to 20.0 per cent of the three-year average in 1975-76.

growth of existing programs. Growth may occur as a program is gradually brought to operational standing over several years, as demand increases due to economic expansion and population growth or as qualitative improvements and extensions are made.

Again, education outlays provide a particularly dramatic example of the impact of economic expansion and population growth. During recent years they have increased at an annual rate of about 25 per cent to the point where they account for over 40 per cent of total provincial expenditure.¹⁰ This occurred as a direct function of the post-war upsurge in birth rates, together with rising costs and rising post-secondary enrolment ratios.

In 1960, births in Ontario reached a peak of 159,000. For more than 20 years they had been increasing steadily from a low of 62,000 in 1937. But while the peak in births occurred about eight years ago, the effect of declining birth rates will not be reflected in lower total enrolments for some time. This is partly because the decline in birth rates has been quite slow, and partly because of increased post-secondary enrolment ratios as well as increased migration from abroad and from other provinces.

A more detailed view of the implications of post-war births for educational enrolment

up to 1975-76 is provided in Table 5. Total elementary school enrolments can be expected to level off after 1970-71. This pattern will be repeated in delayed fashion at the higher education levels. Much depends, however, on the behaviour of enrolment ratios. At present, 15 per cent of 18 to 21 year olds are enrolled as undergraduates and about 2.4 per cent of 21 to 24 year olds as postgraduates. Increases in the complexity of industrial technology are very likely to increase these ratios and offset the effects of the decline in birth rates on total post-secondary enrolment.

The need to meet industrial demand for more highly skilled manpower and broaden the range of post-secondary education, resulted in the rapid development of the CAATS system. The outlook for future enrolment is likely to be about a 66 per cent increase in enrolment next year to reach close to 33,000 students as the institutions move into full operation. If the ratio of student enrolment moves up to 20 per cent of the 18 to 20 year age group by 1975-76, this would then produce a total enrolment of 88,500 in that year. The Department of Education estimates that about 60 per cent of grade 12 graduates will continue to CAATS. If they stayed for an average of two years,

¹⁰Excluding assistance through the Ontario Universities Capital Aid Corporation and the Ontario Education Capital Aid Corporation.

there would be about 25 per cent of the 18 to 20 year olds in CAATS or approximately 110,000 by 1975-76.

Along with the large increases in education enrolments projected to the mid-1970's, there are also likely to be significant cost increases. The Ontario Institute for Studies in Education estimates that elementary school operating costs will increase by 5.3 per cent a year up to 1975 from a base of \$483 per pupil in 1968, while secondary school costs will rise by 6.4 per cent from \$1,027 per

student. Similarly, university operating costs per student have been increasing at 6 to 8 per cent over the long run. More recently per-student costs have grown at even higher rates; hence it is assumed that unit costs will rise at about 8 per cent per year over the period to 1975-76. Details of the joint impact of projected enrolment and cost increases are given in Table 5. Thus, total operating costs for universities are projected to increase by 196 per cent between 1967-68 and 1975-

76, with those of CAATS rising by 277 per cent. Corresponding increases at the elementary and secondary school levels will be less marked at 55 per cent and 99 per cent respectively.

Refinement of the Province's Budgetary Process

The nature of the government's commitments to established programs at any given time emphasizes the importance of developing a system that allows orderly changes in expenditure patterns over the course of several budgets. To achieve this objective, the government is refining the province's budgetary process through the introduction of program budgeting. Briefly, the purpose of this system, which is relatively new for governments, is to place increased emphasis on policy objectives so that limited resources are used with maximum effectiveness and efficiency in achieving those objectives.

The Ontario Government's approach to program budgeting is also based on the recognition that government expenditures may have a number of different effects. These may be usefully divided into two groups:

First, program effects are the direct advantages which accrue from achieving the specified objectives of a program. These may be of a social, cultural or economic nature. Some programs are mainly of a social and cultural nature, with secondary economic results of varying importance. Improved education, health and public housing facilities raise social and cultural standards, but also serve to improve the physical skill and mobility qualities of the province's manpower resources to meet technological and industrial change. On the other hand, the effects of some programs are almost entirely economic. Provincial and provincially-assisted road expenditures, for example, serve to improve the competitiveness of Ontario industries by increasing efficiency in the movement of goods and services.

Second, apart from the specific economic effects of programs, total government expenditures have an important effect on the overall level of economic activity and employment in the province. This total effect related to the need for maintaining a proper balance between the growth of the public and private sectors, which has already been referred to. This process has two aspects. In the long run, increased government expenditures on public facilities and services are required if they are to meet the demand

Table 6 — Projected Enrolment and Operating Costs of Various Educational Streams

	1967-68	1968-69	1975-76	Percentage Increase from 1967-68 to 1975-76
Universities				
Enrolment	79,089	87,900	126,500	59.9
Operating costs per student (increase of 8% a year)	\$2,970	\$3,237	\$5,497	85.1
Total operating costs (million)	\$234.9	\$284.5	\$695.4	196.4
CAATS				
Enrolment ¹	19,437	25,000	44,000	126.4
Enrolment ²	—	33,000	110,000	—
Operating costs per student (increase of 6.5% a year)	\$1,800	\$1,917	\$2,980	65.6
Total operating costs ¹ (million)	\$35.0	\$48.0	\$132.0	277.3
Total operating costs ² (million)	—	\$63.3	\$333.0	—
Secondary Schools				
Enrolment	462,300	483,600	559,500	21.0
Operating costs per student (increase of 6.4% a year)	\$1,027	\$1,093	\$1,687	64.3
Total operating costs (million)	\$474.8	\$528.6	\$943.9	98.8
Elementary Schools				
Enrolment	1,392,900	1,421,300	1,426,900	2.4
Operating costs per student (increase of 5.3% a year) ³	\$482	\$508	\$729	51.2
Total operating costs (million)	\$671.4	\$722.0	\$1,040.2	54.9
Total Post-Secondary Enrolment¹	98,526	112,900	170,500	73.1
Total Post-Secondary Enrolment²	—	120,900	236,500	—
Total Elementary and Secondary Enrolment	1,855,200	1,904,900	1,986,400	7.1

¹These figures are based on minimal increases in CAATS enrolment ratios.

²The enrolment estimates under¹ may, however, be unrealistic, particularly since only 10 per cent of the relevant age group are assumed to be enrolled by 1975-76. As the text and Table 5 show, much higher enrolment ratios may be expected. Thus the figures under² provide a view of the implications of higher enrolment rates for total enrolment.

³The estimates for cost increases for the various education levels are as follows: elementary schools, 5.3 per cent estimate by OISE based on current operating costs and past cost trends; secondary schools, 6.4 per cent estimate OISE based on current operating costs and past cost trends; CAATS, 6.5 per cent based on Dept. of Education estimate of current operating costs which are projected to increase at the same rate as secondary school costs; universities, 8 per cent based on Dept. of University Affairs estimate of current operating costs and past cost trends.

sociated with economic growth in the private sector. In the short run, however, total government expenditures should, as far as possible, complement rather than compete with the demands of industry for economic resources. This is the essence of a counter-cyclical fiscal policy. Thus, increased government expenditures designed to take up unused manpower and other resources will have the effect of maintaining employment and economic growth during periods of relatively slack economic activity. But such increase during periods of buoyant economic activity may have the effect of drawing resources away from the private sector and result in slower rates of industrial growth and increased price pressure.

In recognition of the foregoing broad economic effects of government expenditures, the program budgeting system is being developed in association with a national accounting framework. Thus the Ontario Government hopes to develop basic tools for maximizing expenditures benefits by allowing all programs to be evaluated according to common standards, namely, their effectiveness in terms of specific objectives and their contribution to the overall requirements of the economy. This is a significant change in emphasis from the traditional expenditure evaluation and control which placed primary emphasis on how much money is spent on such items as departmental salaries, travel and maintenance.

The approach to government budgeting now being developed in terms of a system of programs and activities has a number of benefits. First, management has a more appropriate criterion for evaluating the efficiency of resource-use in achieving specified objectives. Second, given program objectives, gaps or overlaps in the component activities within the range of departmental programs are more likely to occur. Third, as needs and objectives change, programs can be more readily adjusted or discontinued because the relationship between costs and benefits becomes more readily apparent.

Complementing the categorization of expenditures by program and activity is their

division into the national accounting categories of wages and salaries, goods and services, transfer payments, loans and interest on public debt. Further sub-grouping into classes of current and capital goods and services, type of transfer payments, for example, clarifies what the economic effects of expenditures are likely to be. The effective relationship between inputs of various kinds and output-efficiency of government produced goods and services can then be analysed. The flow of funds between various parts of the government sector can also be analysed. The contribution by the government sector to real capital formation can be measured more accurately.

Setting the provincial budget in a national accounting framework also makes the total impact of the government sector on the economy as a whole more apparent. The degree of impact can then be assessed and related to the growing demand for social goods and services with which the government is faced.

Departments have made good progress in the task of grouping expenditures by program. All departments are now preparing five-year forecasts in which expenditure estimates will be grouped, both by program and by economic objects. These forecasts will be reviewed in the spring or early summer and become part of the regular budgetary cycle. Once the techniques of program budgeting and the use of a national accounting framework have been tested, they will be increasingly applied in the preparation of the Estimates.

In co-operation with the Department of Civil Service, a training program is being devised to acquaint all levels of management with the concepts and techniques of program budgeting.

To ensure compatibility, the definition of economic objects of expenditure is being undertaken in close co-operation with the Dominion Bureau of Statistics and with reference to the federal expenditures coding system. Placing the provincial budget in a national accounting framework will improve the accuracy of provincial figures in the

National Accounts. This in itself is a contribution to more accurate economic and financial analyses of the nation's economy.

The refinement of the province's budgetary process will also contribute to improved priority planning between levels of government. The need for improved intergovernmental priority planning and for co-ordinated fiscal policy has already been discussed in this paper. It is now widely recognized.

In its Fourth Annual Review, The Economic Council of Canada stated "... it is essential to have more effective co-operation and co-ordination among the three levels of government in regard to ... the pace of overall expansion of government spending; the appraisal of purpose, costs versus benefits, and consistency of objectives and results and the setting and reviewing of priorities The exchange of statistical and other factual information is absolutely essential for appropriate co-operation and review along these lines; the present exchange of information is not adequate to these needs."¹¹

The Smith Committee also pointed out that federal-provincial and inter-provincial fiscal policy planning has now become a vital necessity and that, to achieve it, appropriate technical expertise must be available to governments.¹²

Ontario is the first province to attempt the combined implementation of program budgeting and a national accounting framework. Given the objective of compatibility with the federal expenditures classification, this is already a contribution to the more meaningful exchange of factual information on which co-ordinated fiscal policy decisions must be based. It may also prove to be the initial step towards the nation-wide use of technically compatible figures, so important to the task of achieving co-ordinated fiscal policy planning in a federal state. Given the size of our budget and the significance of our expenditures to the national economy, it is fitting and proper that these measures should have been taken first in Ontario.

¹¹Economic Council of Canada, Fourth Annual Review (Ottawa: Queen's Printer, 1967), p. 264.

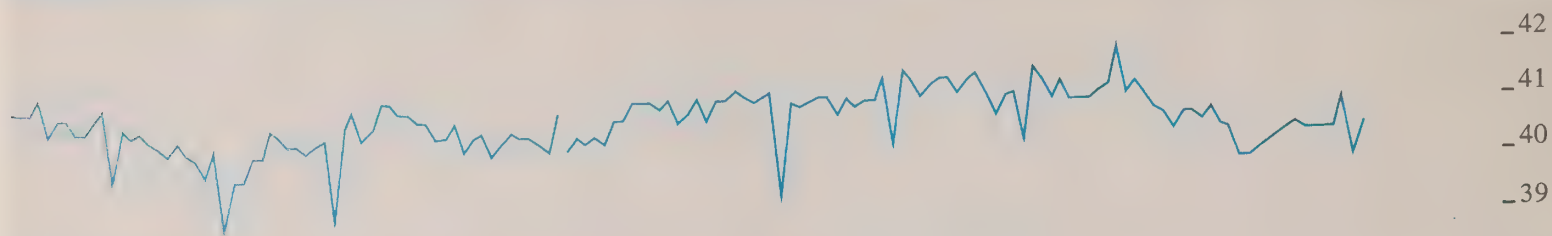
¹²Smith Report, Vol. 1, pp. 25 and 72.

Selected Economic Indicators

Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)

Number



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

\$ Billion

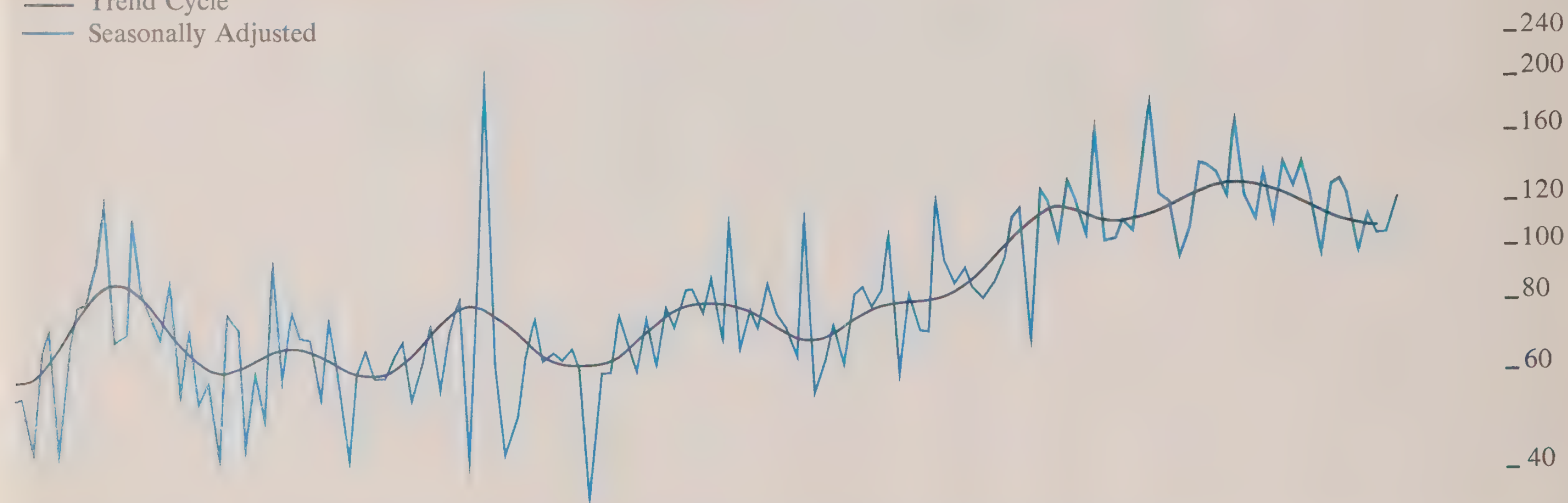


Business, Industrial and Engineering Construction Contracts, Ontario

\$ Million

— Trend Cycle

— Seasonally Adjusted

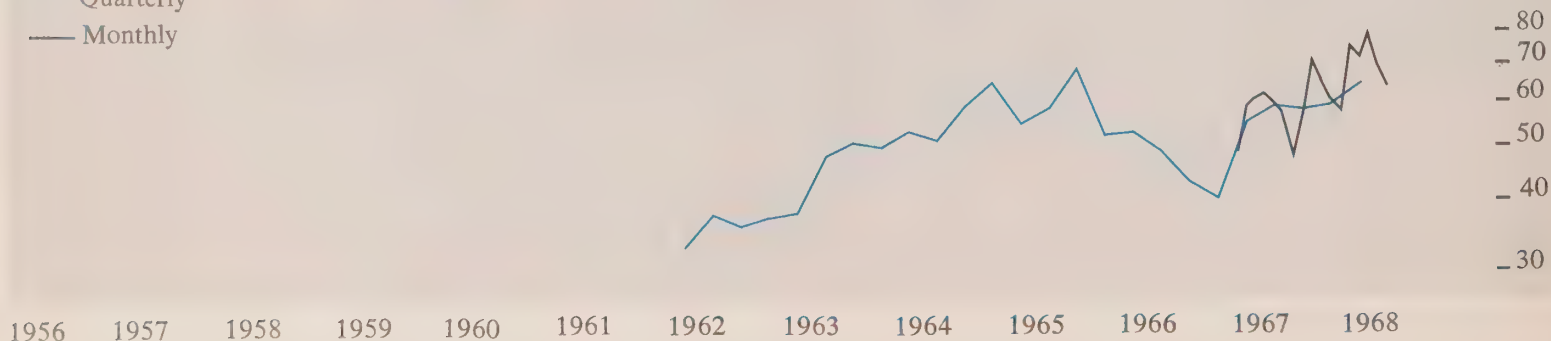


Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

Thousand

— Quarterly

— Monthly



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion

25

20

15

14

13

12

Scale L1

Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index

1956 =

100

160

140

120

100

Scale L2

Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

— Current Dollars

— Constant (1957) Dollars

\$ Billion

60

50

40

30

Scale L1

Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

\$

3.00

2.50

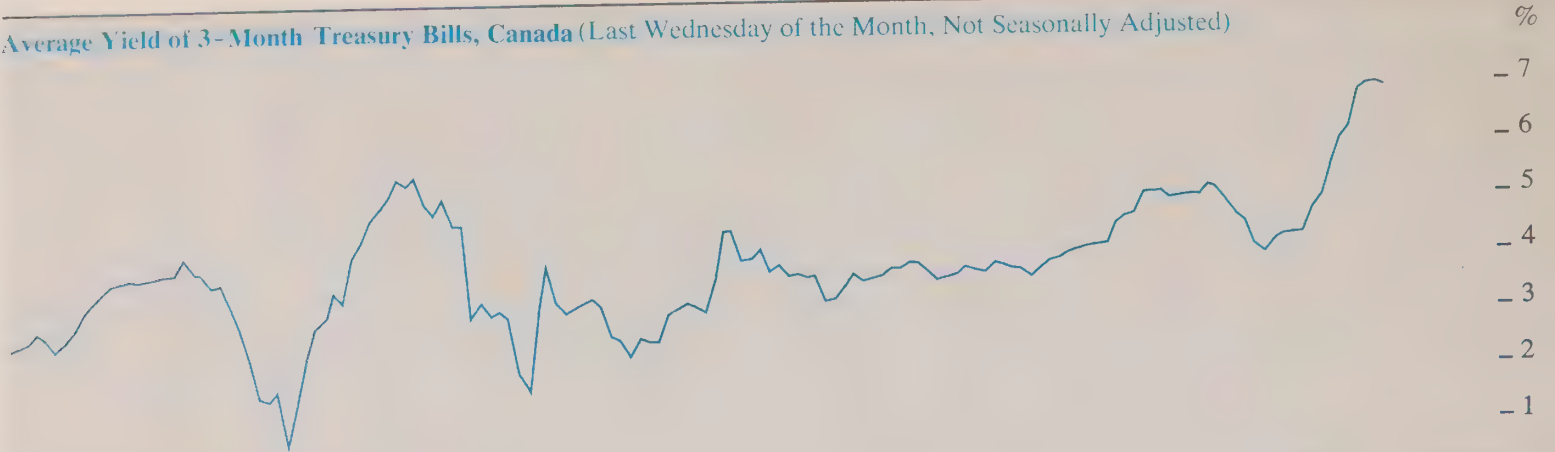
2.00

Scale L1

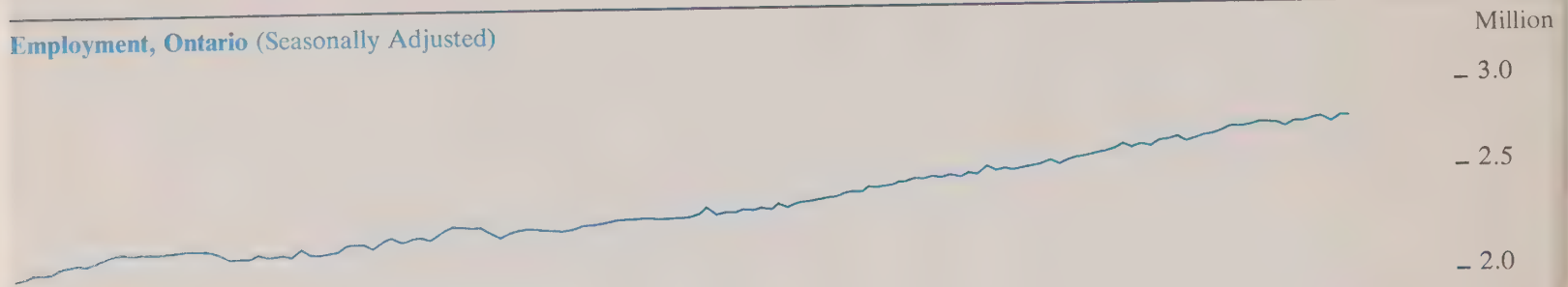
1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Coincidental and Lagging Indicators

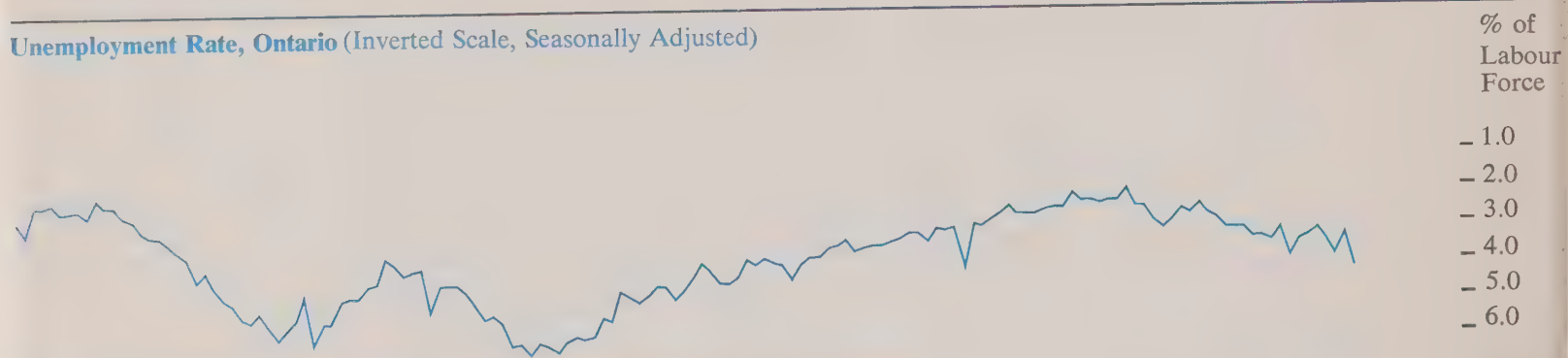
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



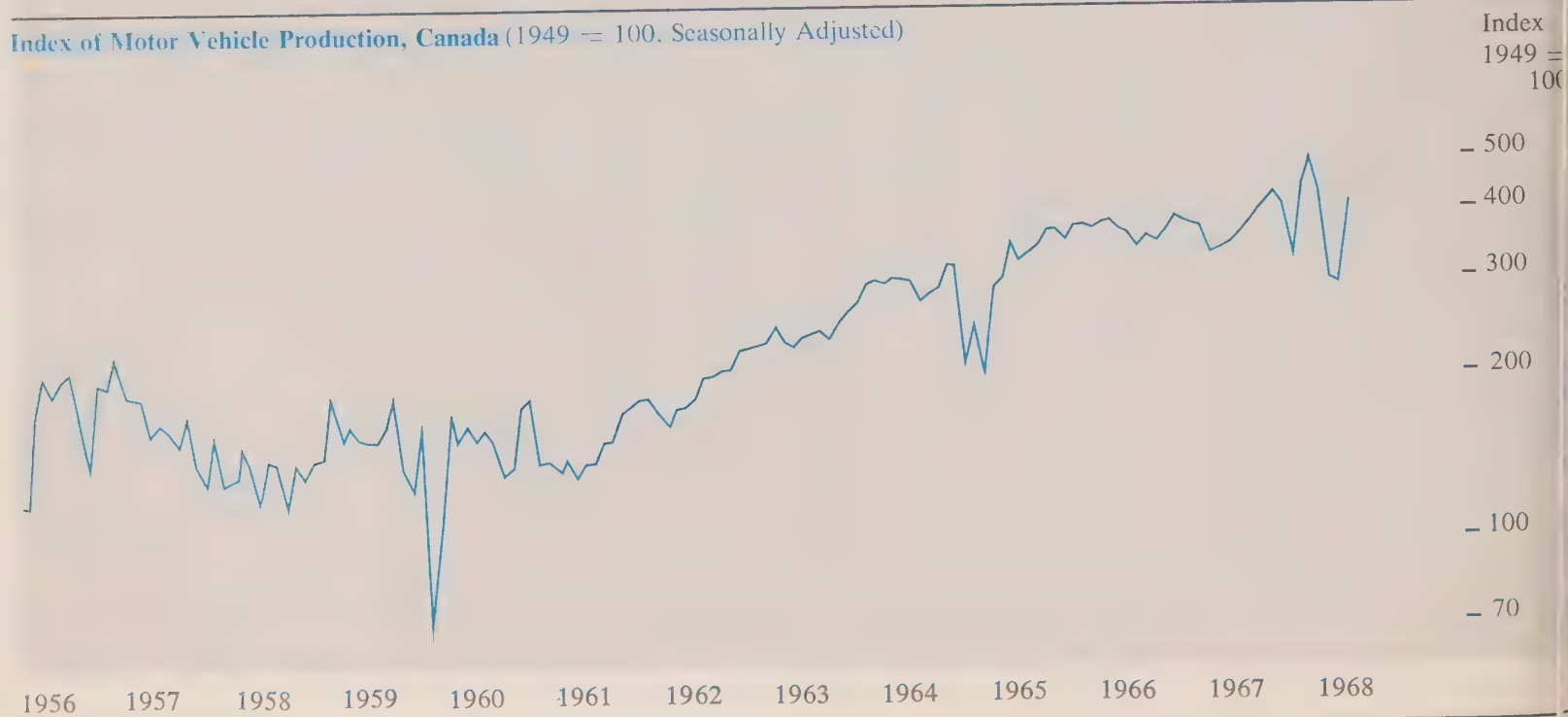
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)



1967 1968

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Leading Indicators														
Average Weekly Hours Worked in Manufacturing	40.3	40.4	40.5	40.4	40.4	40.4	40.4	40.4	39.9	40.5				
New Orders in Manufacturing Industries ^c	3,024	3,117	3,242	3,107	3,161	3,178	3,118	3,308	3,215	3,079	3,078	3,209		
Business, Industrial and Engineering Construction Contracts	143.5	129.0	129.3	121.6	99.2	129.7	133.0	125.4	99.3	114.5	105.1	105.4	122.6	
Urban Housing Starts	60,100	57,800	48,900	57,500	72,100	66,100	61,000	58,700	76,600	72,700	79,400	69,200		
Money Supply	22,522	22,614	22,797	23,191	23,755	23,839	24,041	24,147	24,149	24,079	24,682	24,974	24,987	
T.S.E. Industrial Index ^u	161.44	164.54	169.66	166.85	168.72	157.39	161.60	162.28	157.43	150.24	146.88	160.43	157.87	166.61
Business Failures ^u	40	59	52	26	34	79	43	73	54	59	87	52	50	
Business Failures - Liabilities ^u	3.3	2.9	3.2	4.1	2.6	16.6	2.9	24.3	2.6	1.8	5.6	6.4	2.8	
Coincidental and Lagging Indicators														
Gross National Product ^c (Annual Rate)		62,072			62,372			62,992					64,828	
Average Hourly Earnings in Manufacturing	2.49	2.51	2.55	2.56	2.56	2.58	2.58	2.60	2.59	2.58				
3-Month Treasury Bill Rate ^u	4.24	4.28	4.32	4.34	4.76	4.95	5.46	5.95	6.29	6.80	6.98	6.99	6.95	
Cheques Cashed in Clearing Centres ¹	4,964	5,154	5,121	4,983	5,133	5,081	5,459	5,485	5,006	4,959	5,313	5,031		
Retail Trade	727	761	739	761	777	762	773	767	803	768	780	785		
Labour Force	2,835	2,844	2,862	2,860	2,851	2,853	2,860	2,856	2,857	2,892	2,869	2,890	2,918	2,962
Employed	2,748	2,750	2,767	2,763	2,762	2,746	2,764	2,762	2,769	2,793	2,760	2,796	2,844	
Unemployed	87	94	95	97	89	107	96	94	88	99	109	94	122	118
Unemployed as % of Labour Force	3.1	3.3	3.3	3.4	3.1	3.8	3.4	3.3	3.1	3.4	3.8	3.3	4.2	4.0
Wages and Salaries	1,051	1,053	1,064	1,071	1,075	1,070	1,086	1,094	1,109.6	1,099.5				
Index of Industrial Employment	124.7	124.4	124.9	124.6	124.6	124.4	125.7	125.8	126.1	124.3				
Index of Industrial Production^c														
Total Manufacturing ^c	280.0	280.8	283.6	284.6	284.3	282.4	289.4	291.0	288.2	285.1	285.3	291.5		
Non-Durables ^c	246.9	247.3	249.0	250.9	251.7	247.5	256.3	257.1	253.1	248.4	249.1	257.0		
Durables ^c	242.7	245.1	243.8	245.0	246.0	246.2	249.0	247.1	247.1	250.0	253.9	255.3		
Mining ^c	251.8	249.9	255.2	257.7	258.3	249.0	264.8	268.9	260.2	246.6	243.5	259.0		
Electric Power and Gas Utilities ^c	415.4	424.2	428.4	426.2	421.9	431.2	425.7	440.7	422.8	435.3	439.6	434.3		
Primary Energy Demand (Annual Rate)	563.2	555.1	572.9	565.5	555.8	568.0	571.7	572.9	605.9	596.9	583.0	582.1		
Exports (including re-exports) ^c	50.85	50.70	50.64	51.61	50.98	52.41	53.86	53.78	55.60	55.15	54.01	53.94	53.81	
Imports ^c	951.3	962.6	914.5	925.2	861.3	956.7	969.4	1,023.0	1,077.7	1,140.4	1,125.7	1,166.7		
	911.2	893.5	928.6	900.1	921.8	889.5	882.5	928.7	974.5	1,093.9	970.9	1,033.2		
Unclassified Indicators														
Foreign Exchange Reserves ^{c,u}	2,195	2,169	2,183	2,198	2,221	2,303	2,277	2,268	2,175	2,490	2,244	2,416	2,695	
Industrial Materials Price Index ^{c,u}	254.6	256.7	253.0	252.0	251.2	250.1	252.9	254.3	253.5	252.4	253.0	251.2	255.5	259.9
Consumer Price Index ^{c,u}	148.1	148.8	150.2	150.9	150.7	150.5	151.0	151.8	152.6	152.7	153.2	154.1	154.2	154.7

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.



Ontario Economic Review

Sept/Oct 1968
Volume 6, Number 5

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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The Ontario Economy

The Pattern of Consumer Expenditures at Provincial and Regional Level

R. H. Frank and I. M. Rash
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About the Review

The feature article for the September-October edition of the *Ontario Economic Review* summarizes a pilot study on the pattern of consumer expenditures at provincial and regional level.

The textual and statistical material for this study was developed in the Economic Analysis Branch as part of a continuing econometric program designed to provide detailed quantitative analyses of major sectors of the Ontario economy. This study represents the first of a series of monographs devoted to the development of economic data at provincial and sub-provincial level to provide the basis for the design of an econometric model for the Province of Ontario.

The article was prepared by Mr. R. H. Frank, Director of the Economic Analysis Branch together with Mr. I. M. Rash of the unit's econometric section within the Economic and Statistical Services Division.

Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity – commonly used to define business cycles – do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate – because they relate to future rather than present production – are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuation. Of the three vertical scales used – 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) – only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

Business activity seems to have accelerated moderately in the second quarter of 1968 after two years of slow growth. However, the economy still is running well below capacity as indicated by an unemployment rate averaging above 4.5 per cent for the first six months. This is the highest rate experienced in almost four years. In May and June the unemployment rate turned up sharply following an unusually large influx into the labour force of students seeking summer jobs. The June rate of unemployment seasonally adjusted was 5.5 per cent of the labour force. In the same month total employment was three per cent higher than a year earlier as opposed to a year-to-year increase of about four per cent in June 1967 when the seasonally adjusted unemployment rate was 4.2 per cent.

The main force behind the Canadian expansion in recent months has been exports which for the first half of 1968 have risen by approximately 16 per cent over the same period last year, while imports have risen by less than 10 per cent. As a result the merchandise trade surplus widened sharply to over \$500 million from \$155 million for the same period in 1967. The increase in exports is almost entirely accounted for by shipments to the United States, which rose by over 25 per cent. Such a high rate of growth in exports cannot be expected to continue since the majority of the increase was influenced by the prolonged copper strike in the United States, stock-piling of steel in anticipation of a possible strike and a sharp rise in exports of automobiles and parts under the Canada-United States Automobile Agreement.

Canada's strong merchandise export trade has been sustained despite problems in wheat marketing. Canada's share of total wheat exports of the four major countries involved in such trade has fallen to 20 per cent from 25 per cent in the previous crop year. Not only have no additional orders been placed with Russia and China but wheat exports to additional customers such as Britain and Japan have also declined. At the turn of the crop year on July 31, Canada had approximately 670 million bushels of unsold wheat, the largest carry-over in a decade and second only to the carry-over of 733 million bushels in 1957.

Moreover, the Dominion Bureau of Statistics estimates the 1968 wheat crop at 649 million bushels, considerably above the ten-year average of 540 million bushels. How-

ever, there is some hope for improvement in the coming year since the U.S.S.R. may need to augment current purchase commitments as a result of severe drought in the wheat belt of central and eastern Europe.

Additional problems have been created by persistent heavy rains throughout most of Western Canada. Since the grain handlers' strike on July 15 any eastward movement of wheat to St. Lawrence elevators has been stalled and with existing storage facilities now utilized to capacity much of the crop remains unharvested. The Federal Department of Agriculture estimates that due to wet weather the crop quality has deteriorated rapidly and since August 15 as much as 100 million bushels of the prospective yield may have been lost. With rain continuing further losses are estimated at 30 million to 40 million bushels a week. To the farmers who are paid for their grain when it is delivered to local elevators the present loss of over 100 million bushels represents a financial loss of up to a \$1.50 per bushel or in excess of \$150 million. Losses in quality of that wheat still suitable for harvesting are estimated to be as high as fifty cents a bushel which means that in Saskatchewan, where the rains were heaviest, farmers will be marketing much of their wheat at one dollar a bushel or less. This will mean substantially reduced incomes for many farmers and consequently business across the West will suffer resulting in similar repercussions in eastern Canada.

Taxation in Ontario: A Program for Reform

On September 16th the Select Committee of the Legislature on the Report of the Ontario Committee on Taxation presented its findings in a 314-page document entitled "Taxation in Ontario: A Program for Reform." The Select Committee, appointed on May 31st, 1968, to study the 347 recommendations of the Smith Committee's report, reached its decisions after two months of public hearings in Ontario's major cities and a month of *in camera* deliberations.

The proposed program for reform comprises three main departures from the recommendations of the Smith Report. Unquestionably, the most radical of these departures is the recommendation to substitute income tax credits for exemptions from the Retail Sales Tax (e.g. food and children's clothing) and for the present basic shelter exemption. In the field of real property tax the Select Committee moved to reduce the tax burden on residential property by endorsing the

Smith Committee's recommendation to abolish the split mill rate and advocating a reduction in the proportion of taxable assessment to actual assessment for residential property from 0.70 (which was recommended by the Smith Committee) to 0.60. The decision to recommend this reduction in the tax burden on residential property was prompted by testimony at the public hearings which indicated that the adoption of Smith's package of proposals concerning the taxation of real property would increase the burden of tax on residential property relative to the burden on commercial and industrial property.

In its third major departure, the Select Committee substantially modified the Smith Committee's recommended formula for payments by the Ontario government to mining municipalities. A new equalization grant for ordinary mining municipalities, determined by multiplying the per capita fiscal impairment of the municipality by its population and then by its mill rate, was advocated. Fiscal impairment was defined by the Select Committee as the difference between the average per capita assessment for the province as a whole and the per capita assessment in the mining community in question. In contrast to the Select Committee, the Smith Committee had defined fiscal impairment as the "amount needed to make the community's ratio of commercial and industrial assessment to total assessment equal to that same ratio for similarly situated non-mining municipalities." In conjunction with redefining fiscal impairment the Select Committee rejected the Smith Committee's recommendation to reduce fiscal impairment by the proportion of resident mining employees to the number of all employed persons in the community. Finally the Select Committee suggested that equalization payments could be extended to all fiscally impaired municipalities in the province.

The Select Committee's revised formula for mining revenue payments applies both to ordinary mining communities and to a new class of mining municipality which it labelled mining-industrial municipality. Mining-industrial municipalities would levy a real property tax on the processing facilities of mines within their boundaries; consequently their dependence on payments from the province would be reduced and possibly eliminated. However, if the per capita assessment of a mining-industrial municipality remained below the provincial average after including its

assessment of processing facilities, it would receive an equalization grant as well. An example of a mining-industrial municipality would be an amalgamated Sudbury and Copper Cliff.

Other recommendations of the Select Committee which differ from those in the Smith Committee's report include:

1. A recommendation that corporation and personal income taxes bear a higher share of Ontario's future revenue needs than suggested by the Smith Committee.

2. A recommendation for a new graduated business occupancy tax based on taxable assessment ranging from 10 per cent to 50 per cent of the increment of assessed value of the real property — in contrast to the Smith Committee's recommended flat rate business tax based on 50 per cent of assessment.

3. A definition of a working farm, to enable municipal assessors to distinguish between property for agricultural operations which is to be taxed on 40 per cent of assessment and residential and business properties which are to be taxed on 60 per cent of assessment.¹

4. An immediate start on a four-stage program for implementation of regional government, beginning with discussions at the municipal level and supervised by a special branch of the government.

5. A modification of the Smith Committee's proposals for taxation of resource-based industries.

6. A recommendation to increase the succession duty exemption for widows to \$90,000 from the present \$75,000 and to extend it to include all widowers.

While the Select Committee's report contains a number of departures from the Smith Committee recommendations, the latter can by no means be shelved at this time. Indeed, the majority of the Smith Committee's 347 recommendations were adopted either outright or with some modification by the Select Committee. Moreover, much of the Select Committee's discussion assumes a knowledge of the Smith Committee Report. Of greatest importance however is the fact that the Smith Committee Report remains the only comprehensive primary research on taxation in Ontario and for that reason will continue to provide the background material for assessing the implications of the recommended policies of the Select Committee.

There are four stages to the Ontario government's program to modernize taxes.

The first and longest stage was the Report of the Smith Committee itself. The second step terminates with the Select Committee's Report. In the third stage, the government will prepare its White Paper on taxation in Ontario. Finally, proposed legislation will be debated in the Legislature.

ECC: The Fifth Review

The fifth annual review of the Economic Council of Canada makes an urgent plea for the equitable sharing of rising incomes and the eradication of poverty in Canada.

A 37-page chapter devoted to the problem of poverty begins: Poverty in Canada is real. Its numbers are not in the thousands but the millions. There is more of it than our society can tolerate, more than our economy can afford and far more than existing measures and efforts can cope with. The Council estimates that one Canadian in five suffers from poverty and insists that the elimination of poverty be made a major national goal.

The ECC report, released in September, makes a second strong recommendation: use science and technology as tools for the pursuit of political, economic and social goals. It says, "No task is more important for improving Canada's innovative performance than to strengthen the capabilities of Canadian management to understand and manage technological change and the innovative process." (Innovation is described as the diffusion of existing technology.)

This is the first time the Council has so carefully described the problems of poverty and technological change. This is also the first time that one particular recommendation holds true in every chapter — that is, the need for better information, research and techniques of analysis.

Poverty

Defining low-income families and individuals as those using 70 per cent or more of their incomes for food, clothing and shelter, the Council estimates that in 1961 some 916,000 non-farm families and 416,000 individuals were living below these levels. The total number of persons involved was 4.2 million. Of these, 83 per cent lived elsewhere than in the Atlantic Provinces; 53 per cent lived in Ontario and the Western Provinces. The condition of Indians, Eskimos and Metis is particularly serious, but poverty is by no means confined to these groups.

"There now are some important gaps in the information and analysis required to conduct a truly comprehensive attack on poverty in Canada," the Council says. Filling these gaps by extensive research is essential.

Near-term measures should immediately be effected to fight poverty. These include government review and clarification of existing social policies; exploitation of the anti-poverty potential of the Canada Assistance Plan; and setting up a Senate Committee to enquire into the problem. A longer-term strategy proposed by the Council is that the advantages and disadvantages of new proposals such as a negative income tax and minimum income guarantee be thoroughly examined. "To be consistent with our proposed emphasis on helping those most in need, this would involve the establishment of acceptable minimum standards of living for families and individuals in Canada."

Along with welfare and related social policies the Council would study regional and other economic development programs affecting rates of growth in the economy. Regional balance, like the elimination of poverty, is part of the Council's goal of achieving an equitable distribution of rising incomes.

Federal economic policies with regional implications have had an inconsistent impact on the lagging regions, the Council says. There has been no significant narrowing of regional income disparities. The Council suggests that regional development guidelines to be followed should include: improving the utilization of manpower resources; raising the productivity level within each region; and assuring the expansion of growth-related public services.

Science Policy

The wave of technology following the Second World War has created the need for a science policy — a policy that can systematically organize and apply existing knowledge to achieve practical ends. To make this possible, Canada must first strengthen university business education. U.S. universities have been graduating four times as many business and commerce students (per 1,000 of population) as Canada at the B.A. level. At the graduate level the ratio is 7 to 1.

Canada's total outlay in Research and Development will be \$1 billion in 1970, which is smaller than that of many other advanced, industrialized countries. However,

¹Note that business properties are subject to the additional graduated business occupancy tax.

& D by itself may add nothing to economic growth. It is the innovation process — which brings new products, processes and services to use — that contributes to growth. Thus the role of innovation should be recognized in a science policy. The environment for innovation is created by information exchange between technologically oriented universities and industry, manpower retraining and by speedily and effectively transferring technological knowledge throughout the economy.

The Council says Canada now requires a coherent strategy to co-ordinate and blend the scientific, technological and innovative capabilities of government, the scientific community, business and the universities. The Council itself is now examining the training and development practices of Canadian management and factors affecting management performance.

Canada's technological efforts in industry could be strengthened but only in fields where Canada has a competitive advantage. Canada should support the resource industries and should seize opportunities arising out of world demands for technological products especially those which happen to suit Canadian industrial capabilities.

The Council also stresses efforts in social sciences. It repeats a plea made in the fourth view to apply first-class scientific minds to solve the problems of rapid urbanization. Much more could be done in transportation, housing, air and water pollution, noise and

recreation to improve the human environment.

Closely related to the need to develop a science policy is the need to understand the causes and consequences of the changing structure of the Canadian economy. Of the total employment increase of 2.5 million in Canada from 1946 to 1966, some 2.1 million of the new jobs were in the service industries. (Today about 60 per cent of the labour force is in the service industries.) Since most jobs in service industries do not face much international or domestic competition, it is difficult to measure efficiency. Improved information on output and productivity in the service industries would increase knowledge of productivity performance and help in formulating policies for individual industries.

Economic Performance

Canada's performance in relation to goals set for the medium-term future fell behind last year. In contrast with the 1961-1966 period, the expansion of employment opportunities has not been rapid enough. Unusually high rates of increase in prices and costs, manufacturing wages and interest rates have not been accompanied by equal increases in productivity. The consumer price index went up 4 per cent in both 1966 and 1967. This is inconsistent with the Council's goal of price stability, and higher than price and cost increases in the United States. Business investment has declined since 1966; this must be expanded. Over the medium-term

future, Canada needs a growth rate somewhat slower than in 1961-66 but higher than it has been in 1966-67.

Performance in comparison with other industrially advanced countries was average in the 1950-62 period, the Council says, with two-thirds of real income gains generated from increased labour and capital inputs and a third from factor productivity. Although increases in labour and capital will continue to be important, the quality of inputs must be improved in future through investment and education. Substantial improvements can also be made in expanding international markets.

In agricultural labour productivity, Canada has not kept up with the U.S. although labour productivity has tripled in the last two decades. Average farm incomes still trail behind average non-farm incomes. This is partly because of a 30 per cent higher machinery input per farm worker in the U.S. and because of more sophisticated crop and livestock yield technology. Between 1947 and 1965 higher yields accounted for 170 per cent of the expansion in U.S. crop production but the comparable figure in Canada was only 70 per cent.

The Council recommends that research funds be increased to improve Canada's low ranking in wheat yield per acre and livestock production. Improved yield technology must, however, be accompanied by increased mechanization, increased average farm size, expanded markets and better market organization.

The Pattern of Consumer Expenditures at Provincial and Regional Level

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Introduction

While data on consumption expenditures at national level are published on an annual as well as on a quarterly basis by the Dominion Bureau of Statistics, comparable statistics for the provinces are not available. As consumer expenditures constitute a major economic variable of strategic importance in the development of an Econometric Model and the design of an Input-Output table for the Ontario economy, the statistical decomposition of the national time series represents a first step toward the development of an adequate data base for quantitative economic analysis.

Annual series on consumer expenditures by province were developed for the period 1957-1967. The time series for Ontario was further disaggregated on a spatial and temporal basis to obtain data for the 10 economic regions and a quarterly provincial series. In view of the importance of consumer spending as an economic indicator, a forecasting equation was designed for the prediction of consumer expenditures in Ontario.

The first section of this study describes in detail the estimation procedure for the derivation of annual data on consumer expenditures for the provinces and Ontario's ten economic regions. The statistical series for the provinces and for the regions of Ontario are analysed on a comparative basis to evaluate inter-provincial and inter-regional differences in the pattern of consumer spending.

An independent estimation procedure, designed to provide control estimates for the series developed in Section I is examined in the second part of the report. The results of the test comparison indicate that the estimated series are statistically unbiased and consistent.

The final section summarizes the analytical techniques utilized in the temporal disaggregation of the annual series for Ontario into quarterly data. An auto-regressive equation designed for short-to-medium term forecasting is presented and supplemented with specific forecasts of consumption expenditures during the first three quarters of 1968.

ESTIMATION AND ANALYSIS OF TIME SERIES AT PROVINCIAL AND REGIONAL LEVEL

The development of reliable statistical time series on consumer expenditures in Ontario and the constituent economic regions is of

major significance in view of the strategic importance of this variable both for structural analysis and policy planning. Reflecting the increasing need for detailed regional data, consumer expenditures at subprovincial level were estimated through application of advanced statistical decomposition techniques.

The estimation of consumer expenditures by province is, conceptually, a problem of spatial disaggregation of the national time series. The process of disaggregation is facilitated by the availability of series on economic key variables such as personal disposable income and retail sales at provincial level. A substantial amount of available collateral information was utilized to ensure a high degree of reliability of the statistical estimates.

The technique adopted for the decomposition of the national time series was selected under the statistical criterion of optimal consistency and efficiency after extensive testing of alternative estimators. In addition, the estimation procedure was designed to minimize the time lag between the publication of input data and the availability of output series to secure maximum timeliness.

The estimates presented form the basis of a comparative analysis of differential growth patterns of consumer expenditures at provincial and sub-provincial level.

Preliminary to the exposition of the analysis, the notation adopted in this study is introduced:

- C_n : Consumer expenditures on goods and services at national level
- N_n : Population of Canada
- Y_n : Personal disposable income, Canada
- C_{pi} : Consumer expenditures on goods and services in province i
- N_{pi} : Population of province i
- Y_{pi} : Personal disposable income for province i

For the economic regions of Ontario:

- C_{rj} : Consumer expenditures on goods and services in region j
- N_{rj} : Population of region j
- Y_{rj} : Personal disposable income for region j

As economic theory, supported by detailed empirical evidence, suggests that personal disposable income constitutes the major determinant of consumer expenditures, a linear equation relating these variables on a per capita basis was specified:

$$C_{pi}/N_{pi} = a_0 + a_1 Y_{pi}/N_{pi}$$

which can be transformed to:

$$C_{pi} = a_0 N_{pi} + a_1 Y_{pi} \quad \dots (1)$$

Summing both sides of equation (1) over the index i yields:

$$\sum_i C_{pi} = a_0 \sum_i N_{pi} + a_1 \sum_i Y_{pi}$$

ie. $C_n = a_0 N_n + a_1 Y_n \quad \dots (2)$

using the identities

$$\sum_i C_{pi} = C_n, \quad \sum_i N_{pi} = N_n$$

$$\text{and } \sum_i Y_{pi} = Y_n$$

A similar rationale underlies the derivation of estimating equations for consumer expenditures in the ten economic regions of Ontario:

$$C_{rj}/N_{rj} = b_0 + b_1 Y_{rj}/N_{rj}$$

$$C_{rj} = b_0 N_{rj} + b_1 Y_{rj} \quad \dots (3)$$

Summing over the index j :

$$\sum_j C_{rj} = b_0 \sum_j N_{rj} + b_1 \sum_j Y_{rj}$$

$$\text{ie. } C_p = b_0 N_p + b_1 Y_p \quad \dots (4)$$

as

$$\sum_j C_{rj} = C_p; \quad \sum_j N_{rj} = N_p; \quad \sum_j Y_{rj} = Y_p$$

Equations (2) and (4) were statistically estimated on the basis of data for the observational period 1957-1966 and the resultant parametric information was utilized in conjunction with equations (1) and (3) to arrive at time series on consumer expenditures by province and region.

The numerical estimates of the parameters are presented in equations (2a) and (4a):

$$C_n = 0.1011 N_n + 0.8613 Y_n$$

(0.0011) (0.0005) $R^2 = 0.998 \quad \dots (2a)$

$$C_p = 0.09723 N_p + 0.86337 Y_p$$

(0.00113) (0.00055) $R^2 = 0.999 \quad \dots (4a)$

The parameters of both equations are statistically highly significant as reflected by their extremely small variances, while the high values of the respective R^2 statistics are indicative of the explanatory power of the selected independent variables. The historical time series derived by simultaneous application of the equation system (1, 2a, 4a) are presented in Tables 1 and 2, while percentage distributions based on these data appear in Tables 3 and 4.

Table 4 – Percentage Distribution of Consumption Expenditure by Region, Ontario, 1957 to 1967

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Metropolitan	40.2	41.1	40.5	40.9	41.8	41.7	41.9	42.1	42.0	42.5	42.7
Niagara	13.7	13.0	13.3	13.0	12.9	13.0	13.1	13.2	13.2	13.0	13.0
Eastern Ontario	10.5	10.5	10.6	10.8	11.0	10.9	10.8	10.7	10.6	10.7	10.7
Northeastern Ontario	7.6	7.3	7.4	7.3	7.0	6.9	6.5	6.3	6.1	5.9	5.9
Lake St. Clair	6.8	6.6	6.7	6.7	6.3	6.4	6.5	6.5	6.9	6.7	6.6
Lake Erie	5.2	5.7	5.8	5.8	5.8	5.6	5.8	5.7	5.7	5.8	5.9
Mid-Western Ontario	5.3	5.2	5.3	5.3	5.2	5.4	5.5	5.6	5.6	5.7	5.8
Lake Ontario	4.0	4.0	4.0	3.9	3.8	3.9	3.9	3.8	3.8	3.7	3.7
Northwestern Ontario	3.5	3.3	3.2	3.2	3.1	3.0	2.8	2.8	2.8	2.7	2.6
Georgian Bay	3.2	3.3	3.2	3.1	3.1	3.2	3.2	3.3	3.3	3.3	3.3
Province	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Estimates of consumer expenditure by province for 1967 and by region for 1966 and 1967 are preliminary as data on personal disposable income at provincial and regional level are not yet available. In order to eliminate the recurrent time-lag in the publication of income data, a set of equations was developed formalizing the procedure for arriving at preliminary estimates.

Equations of the form

$$C_i = a_i + b_i C_n + \epsilon_i^1 \quad (i = 1, 2, \dots, 10)$$

were estimated for each of the provinces on the basis of data for the period 1957-1966 where C_i and C_n denote consumer expenditure on goods and services in province i and at national level respectively. Reflecting the wider fluctuations of consumption expenditures in Saskatchewan due to the pronounced volatility of farm income, the relevant equation for Saskatchewan was specified as

$$C_s = a_s + b_s C_n + c F_n + \epsilon_s$$

with C_s and C_n representing consumer expenditure in Saskatchewan and in Canada respectively while F_n denotes the net income of farm operators from farm production in Canada.

Estimates of the parameters for the generalized provincial equations are shown in the following synopsis.

Similarly, for each of the ten economic regions of Ontario equations of the generalized form

$$C_j = a_j + b_j C_p + \epsilon_j \quad (j = 1, 2, \dots, 10)$$

were estimated for the observation period 1957-1965 with the symbols C_j and C_p representing consumer expenditure in region j and in Ontario respectively.

Numerical values of the parameters of the regional equations are also presented in summary form.

Newfoundland:	$C_1 = -0.05829 + 0.01817 C_n$ (0.00002)	$R^2 = 0.996$
Prince Edward Island:	$C_2 = -0.00927 + 0.00426 C_n$ (0.00005)	$R^2 = 0.971$
Nova Scotia:	$C_3 = 0.14503 + 0.02602 C_n$ (0.00003)	$R^2 = 0.994$
New Brunswick:	$C_4 = 0.01058 + 0.02286 C_n$ (0.00001)	$R^2 = 0.997$
Quebec:	$C_5 = -0.29999 + 0.26596 C_n$ (0.00003)	$R^2 = 0.996$
Ontario:	$C_6 = 0.31499 + 0.37818 C_n$ (0.00003)	$R^2 = 0.998$
Manitoba:	$C_7 = 0.19561 + 0.04198 C_n$ (0.00000)	$R^2 = 0.980$
Saskatchewan:	$C_8 = -0.10571 + 0.02425 C_n + 0.53931 F_n$ (0.00843) (0.12078)	$R^2 = 0.968$
Alberta:	$C_9 = -0.17198 + 0.08165 C_n$ (0.00001)	$R^2 = 0.989$
British Columbia:	$C_{10} = -0.05728 + 0.10733 C_n$ (0.00002)	$R^2 = 0.988$
Metropolitan:	$C_1 = -0.38240 + 0.045319 C_p$ (0.01608)	$R^2 = 0.999$
Niagara:	$C_2 = 0.04241 + 0.12686 C_p$ (0.00003)	$R^2 = 0.980$
Eastern Ontario:	$C_3 = -0.00272 + 0.10762 C_p$ (0.00001)	$R^2 = 0.999$
Northeastern Ontario:	$C_4 = 0.35353 + 0.03257 C_p$ (0.00001)	$R^2 = 0.960$
Lake St. Clair:	$C_5 = -0.02834 + 0.06866 C_p$ (0.00003)	$R^2 = 0.950$
Lake Erie:	$C_6 = -0.05644 + 0.06264 C_p$ (0.00001)	$R^2 = 0.980$
Mid-Western Ontario:	$C_7 = -0.11076 + 0.06539 C_p$ (0.00000)	$R^2 = 0.999$
Lake Ontario:	$C_8 = 0.05629 + 0.03318 C_p$ (0.00000)	$R^2 = 0.999$
Northwestern Ontario:	$C_9 = 0.15184 + 0.01531 C_p$ (0.00000)	$R^2 = 0.930$
Georgian Bay:	$C_{10} = -0.02393 + 0.03463 C_p$ (0.00000)	$R^2 = 0.999$

¹Represents the stochastic term in the regression equation.

The extremely small variances of the parameters in all the equations reflect the high degree of statistical reliability and significance while the values of the coefficients of determination imply minimal residual variation of the derived estimates.

The temporal characteristics of the provincial and regional series were analysed on the basis of their respective percentage distribution by regressing the relative shares on the time variate and applying the standard statistical tests of significance to the resultant parameters and coefficients of determination. Examination of the provincial distribution, shown in Table 3, reveals considerable temporal stability in the relative shares of the provinces, whereas, reflecting wide variations in regional income growth and other differential factors, the distribution pattern for the ten economic regions of Ontario, shown in Table 4, is characterized by a significant decline in the relative share of some regions (Northwestern and Northeastern) accompanied by offsetting increases in more dynamic areas.

As consumer expenditures per capita constitute an important indicator of the stage of development reached by an economic unit, provincial and regional series on consumer expenditures per capita were computed and are presented in Tables A-1 and A-2 of the Appendix. While it is recognized that constant dollar values of the variable would be more appropriate for comparative analyses, the unavailability of suitable price indices has precluded deflation of the series which are shown in current dollars.

Annual rates of growth of consumer expenditures per capita by province and by region are shown in Table 5. Over the period 1957-1967, the growth rates for all provinces with the exception of Ontario and British Columbia exceeded the national average.

Among the economic regions of Ontario, the Niagara, Metropolitan, Northwestern and Northeastern regions experienced rates of growth lower than the provincial rate during the same period.

As the structural dependence of consumer expenditures on personal disposable income is an important tool in the analysis of the macro-dynamic behaviour of economic systems, consumption functions for the provinces and for the regions were statistically estimated.

On the basis of the series developed in this study equations of the form:

$$C_{pt} = a_1 + b_1 Y_{pt} + \epsilon_t \quad \dots (5)$$

$$C_{rt} = a_1 + b_1 Y_{rt} + \epsilon_t \quad \dots (6)$$

were estimated for the provinces and Ontario's ten economic regions and the numerical values of the parameters a_1 , b_1 are presented in Tables A-3 and A-4 of the Appendix.

Although the simultaneous equations approach is, on theoretical grounds, preferable to the single equation estimation procedure actually used, it is feasible only in the context of a full scale econometric model currently being designed and tested by the Department's Econometric Research Unit.

While a more detailed analysis of the statistical time series developed in this paper is beyond the scope of this study, the availability of these data will in the future greatly facilitate econometric studies and the formulation of economic policies at provincial and regional level.

THE IMPACT OF THE INCOME DISTRIBUTION ON THE LEVEL OF CONSUMPTION EXPENDITURES

While the estimates of personal consumption expenditures presented in Section I are derived primarily from the aggregate level of

personal disposable income with income distribution represented only implicitly through inclusion of a demographic variable, an independent estimation procedure based on detailed income distribution data for nine income classes at national and provincial level was developed. The purpose of the analysis was to test the frequently advanced hypothesis that, in addition to the aggregate level of personal disposable income, the varying configuration of the income distribution has a pronounced impact on consumption expenditures.

Underlying this hypothesis is the basic assumption that low income recipients consume a greater proportion of disposable income than high income earners with the result that the aggregate average propensity to consume is expected to be highly sensitive to the actual distribution of disposable income. While the marked degree of variation in the propensity to consume by income class has been demonstrated conclusively by numerous cross-sectional studies, the present analysis attempts to determine the precise quantitative impact on the overall propensity.

For the purpose of this study, income recipients were classified into the following income classes adopted from official Taxation Statistics:

1. up to \$ 1,000
2. \$ 1,000 - \$ 2,000
3. \$ 2,000 - \$ 3,000
4. \$ 3,000 - \$ 4,000
5. \$ 4,000 - \$ 5,000
6. \$ 5,000 - \$ 6,000
7. \$ 6,000 - \$10,000
8. \$10,000 - \$20,000
9. \$20,000 and over

Using the following notation:

C_i : Consumption expenditure during year t by income recipients in group i .

Y_i : Disposable income accruing to income recipients in group i during year t . ($i = 1, 2, 3, \dots, 9$)

$b_i = C_i/Y_i$ represents the average propensity to consume (APC) for group i in year t .

$$\begin{aligned} \text{As } C &= \sum_{i=1}^9 C_i = \sum_{i=1}^9 b_i Y_i \\ &= \sum_{i=1}^9 b_i (Y_i/Y) Y \\ &= \sum_{i=1}^9 (b_i w_i) Y \quad \dots (7) \end{aligned}$$

Table 5 — Annual Rates of Growth of Consumption Expenditure per Capita

Provinces	Per Cent	Ontario Economic Regions	Per Cent
Prince Edward Island	6.69	Georgian Bay	5.90
Saskatchewan	6.03	Lake Erie	5.78
Newfoundland	5.54	Lake St. Clair	4.77
New Brunswick	5.25	Mid-Western Ontario	4.69
Manitoba	4.82	Lake Ontario	4.34
Nova Scotia	4.72	Eastern Ontario	4.28
Alberta	4.68	Niagara	3.64
Quebec	4.62	Metropolitan	3.03
Ontario	3.75	Northwestern Ontario	1.91
British Columbia	3.62	Northeastern Ontario	1.75
Canada	4.34	Province	3.75

Where C equals total consumption expenditure for Canada in year t , while Y represents total disposable income for Canada in year t and $w_i = Y_i/Y$ ($i = 1, 2, \dots, 9$) is the proportion of total personal disposable income accruing to income recipients in group i .

From equation (7) the following relationship is derived:

$$C/Y = B = \sum_{i=1}^9 b_i w_i \quad \dots (8)$$

implying that the overall propensity to consume, B , can be conceived as a weighted average of the APC's for the nine income groups under consideration. The weights w_i necessarily sum to unity:

$$\sum_{i=1}^9 w_i = \sum_{i=1}^9 Y_i/Y = Y/Y = 1$$

For a given year, B can readily be calculated as C/Y , since both C and Y are available from the National Accounts. The weights w_i can also be derived from "Taxation Sta-

tistics" published by the Department of National Revenue. Thus equation (8) is to be solved for the b_i in terms of B and w_i which are known constants.

As this equation cannot be solved for b_i without introducing additional mathematical restrictions, the following plausible constraints were imposed:

$$1.0 > b_1 > b_2 > b_3 > \dots > b_9 > 0$$

These inequalities give precise mathematical expression to the basic assumption that the APC for low income groups would be greater than the APC for higher income classes.

To facilitate the solution of the equation system, different experimental values of the inter-class propensity differentials ($b_{i+1} - b_i$) were used.

Based on experimental conditions satisfying the statistical criterion of maximum likelihood, three solution vectors were derived and are exhibited in Table 6. The income distribution weights (w_i) for Canada and for the provinces (1965) are shown in Table 7. The values of b_i obtained under all three sets of conditions conform to a priori requirements, with the exception of $b_8 = 0.683$ under Set 3. This value is somewhat smaller than could be reasonably expected.

Table 6 — Values of b_i under Three Alternative Sets of Constraints on ($b_{i+1} - b_i$)

Income Range	Set 1	Set 2	Set 3
0 - 1,000	0.990,811	0.956,061	0.999,412
1,000- 2,000	0.983,666	0.952,916	0.998,881
2,000- 3,000	0.975,627	0.949,968	0.998,349
3,000- 4,000	0.964,909	0.994,070	0.993,564
4,000- 5,000	0.953,297	0.937,780	0.984,844
5,000- 6,000	0.930,967	0.927,557	0.949,644
6,000-10,000	0.892,559	0.914,387	0.907,001
10,000-20,000	0.819,317	0.855,413	0.683,045
20,000 +	0.746,968	0.763,020	0.657,310

Table 7 — Income Distributions — Canada and the Provinces, 1965

Income Range	Canada	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec
Under 1,000	0.013,842	0.043,443	0.037,569	0.029,232	0.035,196	0.019,818
1,000- 2,000	0.055,449	0.082,902	0.092,837	0.075,950	0.080,469	0.051,591
2,000- 3,000	0.098,982	0.128,186	0.183,518	0.139,675	0.142,534	0.102,548
3,000- 4,000	0.128,454	0.170,928	0.167,407	0.166,401	0.172,570	0.141,785
4,000- 5,000	0.146,569	0.171,573	0.139,350	0.170,487	0.169,458	0.157,892
5,000- 6,000	0.142,868	0.123,036	0.102,917	0.127,443	0.128,749	0.136,765
6,000-10,000	0.264,646	0.185,598	0.163,459	0.187,566	0.168,119	0.236,327
10,000-20,000	0.099,397	0.066,135	0.076,157	0.068,753	0.072,591	0.092,606
20,000 and Over	0.049,788	0.028,194	0.036,782	0.034,490	0.030,376	0.060,663

Income Range	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Northwest Territories
Under 1,000	0.018,077	0.025,290	0.023,858	0.028,052	0.018,492	0.021,340
1,000- 2,000	0.045,000	0.064,181	0.062,736	0.058,327	0.045,088	0.039,457
2,000- 3,000	0.087,161	0.118,184	0.121,928	0.108,822	0.082,925	0.065,010
3,000- 4,000	0.115,763	0.148,924	0.142,434	0.129,089	0.099,895	0.086,035
4,000- 5,000	0.141,143	0.156,231	0.146,974	0.140,638	0.129,505	0.104,510
5,000- 6,000	0.148,761	0.145,131	0.137,324	0.136,227	0.150,029	0.135,920
6,000-10,000	0.285,020	0.224,023	0.234,810	0.257,071	0.331,509	0.424,656
10,000-20,000	0.106,931	0.079,957	0.099,608	0.104,334	0.101,458	0.113,210
20,000 and Over	0.052,139	0.038,076	0.030,324	0.037,435	0.041,094	0.009,859

Source: Taxation Statistics, 1967 edition Department of National Revenue.

From the values of b_i listed in Table 6 and using the weights w_i presented in Table 7, the average propensities to consume (APC's) for the provinces were computed. Thus for Ontario,

$$APC_1 = \sum_{i=1}^9 b_i w_i$$

where b_i are the values listed under Set 1 in Table 6 and w_i are the income distribution weights for Ontario given in Table 7. APC_2 , APC_3 can be derived by similar calculations using values of b_i listed in Table 6 under Set 2 and Set 3 respectively.

APC's for the other provinces were computed similarly and are presented in Table 8.

On the basis of these results, a precise measure can be assigned to the error which would arise if the income distribution factor were ignored in the estimation of the APC's for the provinces. Denoting by APC^* the average propensity to consume unadjusted for the configuration of the income distribution, the conventional formula:

$$\text{Percentage error} = \frac{APC^* - APC}{APC} \times 100$$

was adopted as an appropriate measure of the error.

Table 9 summarizes the percentage errors by province for alternative sets of b_i .

Table 9 — Percentage Errors

	Set 1	Set 2	Set 3
Newfoundland	-1.85	-1.09	-2.71
Prince Edward Island	-1.84	-0.99	-2.44
Nova Scotia	-1.59	-0.91	-2.36
New Brunswick	-1.81	-1.04	-2.57
Quebec	-0.09	0.05	-0.12
Ontario	0.38	0.21	0.57
Manitoba	-0.95	-0.57	-1.45
Saskatchewan	-0.78	-0.52	-1.03
Alberta	-0.36	-0.26	-0.41
British Columbia	0.39	0.08	0.41
Northwest Territories	0.51	-0.15	0.47

Examination of the table reveals that the deviations are statistically quite small ranging from 2.71 percent to 0.05 percent with the average error amounting to only 0.94 percent. For Ontario in particular, the percentage errors are virtually negligible, varying from 0.21 percent to 0.57 percent.

For comparative purposes estimates of consumption expenditures by province for

Table 8 — Average Propensities to Consume

	Set 1	Set 2	Set 3
Newfoundland	0.933,584	0.926,482	0.941,881
Prince Edward Island	0.933,539	0.925,576	0.939,246
Nova Scotia	0.931,177	0.924,824	0.938,533
New Brunswick	0.933,224	0.925,982	0.940,497
Quebec	0.917,201	0.915,900	0.917,441
Ontario	0.912,905	0.914,467	0.911,143
Manitoba	0.925,140	0.921,620	0.929,852
Saskatchewan	0.923,534	0.921,138	0.925,845
Alberta	0.919,682	0.918,763	0.920,102
British Columbia	0.912,805	0.915,604	0.912,563
Northwest Territories	0.911,709	0.917,723	0.912,093
Canada	0.916,347	0.916,347	0.916,347

1965, based on the propensities presented in Table 8, were computed and are shown in tabular form in the Appendix. Table 10 summarizes the analysis of percentage differences between these estimates and the comparable data developed in Section I.

Table 10 — Percentage Differences¹

	Set 1	Set 2	Set 3
Newfoundland	-2.01	-2.76	-1.14
Prince Edward Island	-0.33	-1.18	0.28
Nova Scotia	-0.37	-1.05	0.42
New Brunswick	-0.72	-1.49	0.06
Quebec	-0.89	-1.03	-0.86
Ontario	0.19	0.36	0.00
Manitoba	0.63	0.25	1.15
Saskatchewan	0.66	0.40	0.91
Alberta	0.28	0.18	0.32
British Columbia & Northwest Territories	0.21	0.52	0.19

$$^1 \frac{C_2 - C_1}{C_1} \times 100$$

C_1 , C_2 : Estimates derived in Sections 1 and 2 respectively.

Inspection of the table shows that the overall percentage differences vary from zero to 2.76 percent averaging 0.69 percent while the estimates for Ontario differ by less than 0.50 percent.

On the basis of this analysis it can be concluded that estimation procedures which do not incorporate explicitly detailed information on the configuration of the income distribution yield estimates virtually identical with those generated by methods utilizing income distribution data.

ESTIMATION AND FORECASTING OF QUARTERLY CONSUMER EXPENDITURES IN ONTARIO

The Dominion Bureau of Statistics publishes quarterly estimates of consumer expenditures on goods and services. The procedure used at DBS to obtain quarterly series on consumer expenditures is described in *National Accounts, Income and Expenditure by Quarters, 1947-1961*, catalogue No. 13-519. Consumer expenditures on goods and services are conceived as the sum of three components: (1) consumer expenditures on commodities, (2) consumer expenditures on services, and (3) net personal expenditure abroad.

For the derivation of historical quarterly series at national level, DBS allocates these components on the basis of three different allocators. Thus consumer expenditures on commodities, for example, are allocated on the basis of adjusted retail sales data, while the remaining components are determined similarly through application of collateral time series. Since in the case of Ontario the elaborate allocation procedures followed by DBS did not prove feasible due to lack of sufficiently detailed statistics, alternative estimation procedures were explored.

Before describing in detail the methodology underlying the estimation procedures used, a notational framework is introduced to facilitate exposition:

C_{jt} : consumer expenditures on goods and services at national level for quarter j of year t . ($j = 1, 2, 3, 4$)

C_t : consumer expenditures on goods and services at national level for year t , while the corresponding quantities for Ontario are denoted by C^*_{jt} and C^*_j respectively.

R_{jt} , R^*_{jt} : retail sales in Canada and Ontario respectively for the j^{th} quarter of year t .

R_t , R^*_t : retail sales in Canada and Ontario for year t .

In addition, the following coefficients relating quarterly to annual data are defined:

$$C_{jt}/C_t = c_{jt}$$

$$C^*_{jt}/C^*_t = c^*_{jt}$$

$$R_{jt}/R_t = r_{jt}$$

$$R^*_{jt}/R^*_t = r^*_{jt}$$

As annual estimates of consumer expenditures in Ontario (C^*_t) have been derived in Section I the problem is reduced to the decomposition of C^*_t into a quarterly series C^*_{jt} .

The decomposition can be effected by applying the national coefficients c_{jt} to the Ontario annual consumption data C^*_t to obtain quarterly estimates for the province on the basis of the algebraic expression:

$$\begin{aligned} C^*_{jt} &= c_{jt} C^*_t \\ \sum_j C^*_{jt} &= \sum_j c_{jt} C^*_t \\ &= C^*_t \sum_j c_{jt} = C^*_t \end{aligned}$$

However, as this method involves the assumption that the quarterly variation in consumer expenditures in Ontario replicates the national pattern, this hypothesis was subjected to extensive empirical testing.

If, instead of using the method described in *National Accounts, Income and Expenditure by Quarters, 1947-1961*, the Dominion Bureau of Statistics were to use quarterly retail sales as an allocator for all the components of consumer expenditures, quarterly estimates at national level would be derived from the equation:

$$C_{jt} = r_{jt} C_t \quad j = 1, 2, 3, 4$$

$$\begin{aligned} \sum_{j=1}^4 C_{jt} &= \sum_{j=1}^4 r_{jt} C_t \\ &= C_t \sum_{j=1}^4 r_{jt} = C_t \end{aligned}$$

This approach was used to compute national figures on consumer expenditures on a quarterly basis and the resultant estimates were compared with the quarterly series published by DBS for the period 1960-65. The two

sets of data were virtually identical on the basis of the chi-square test while percentage deviations of the computed figures from the published estimates were insignificant, thus implying that quarterly retail sales allocate annual data at national level in substantially the same way as the actual procedure used by the Dominion Bureau of Statistics.

The second stage of the test consisted in comparing the pattern of quarterly variation of retail sales in Ontario with the variation, over quarters, of the national consumer expenditure data. Again, on the basis of the chi-square test and examination of percentage deviations of r^*_{jt} from c_{jt} , it was established that the hypothesis of equality between c^*_{jt} and c_{jt} is fully consistent with empirical evidence.

Based on the equivalence of national and provincial parameters confirmed by the preceding tests, the series shown in Table 11 was computed, using the formula:

$$C^*_{jt} = c_{jt} C^*_t \quad \dots (9)$$

while the estimates presented in Table 12 were derived from the expression:

$$C^*_{jt} = r^*_{jt} C^*_t \quad \dots (10)$$

As is shown in Table 13, the two quarterly series for Ontario do not differ significantly with the actual differences being, in general, less than 4 percent. The close similarity of the two independent sets of estimates is reflective of the symmetry and transitivity of retail sales and consumer expenditures data at national and provincial level.

Table 11 — Ontario Consumption Expenditure: Quarterly Estimates

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total For Year
	\$ Billion				
1957	1.808022	1.981680	1.966684	2.165597	7.922
1958	1.941638	2.103538	2.087585	2.339220	8.472
1959	2.037901	2.193733	2.169910	2.421428	8.823
1960	2.108373	2.289162	2.247172	2.507272	9.152
1961	2.183023	2.372359	2.351756	2.604851	9.512
1962	2.360168	2.527826	2.454131	2.766853	10.109
1963	2.495472	2.680975	2.630384	2.973156	10.780
1964	2.658927	2.830959	2.787860	3.139229	11.417
1965	2.840251	3.097360	3.038711	3.475652	12.452
1966	3.135469	3.327667	3.328834	3.763030	13.555
1967	3.354332	3.621426	3.565379	4.036562	14.578

Formula Used: $C^*_{jt} = c_{jt} C^*_t$

Table 12 — Ontario Consumption Expenditure: Quarterly Estimates

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total For Year
	\$ Billion				
1957	1.760403	2.041293	1.984144	2.136143	7.922
1958	1.872905	2.173737	2.068116	2.357215	8.472
1959	1.962579	2.293724	2.152759	2.413928	8.823
1960	2.045755	2.375374	2.216312	2.514530	9.152
1961	2.094694	2.448864	2.349007	2.619424	9.512
1962	2.272402	2.588844	2.367022	2.880711	10.109
1963	2.392146	2.774739	2.544629	3.068462	10.780
1964	2.576577	2.920833	2.716549	3.202925	11.417
1965	2.661241	3.208058	2.945570	3.637104	12.452
1966	3.123248	3.287413	3.239387	3.904952	13.555
1967	3.161227	3.739700	3.511269	4.165503	14.578

Formula Used: $C^*_{jt} = r^*_{jt} C^*_t$

Table 13 — Percentage Differences¹

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
	Per Cent			
1960	2.97	-3.77	1.37	-0.29
1961	4.05	-3.22	0.12	-0.56
1962	3.72	-2.41	3.55	-4.11
1963	4.14	-3.50	3.26	-3.21
1964	3.10	-3.17	2.56	-2.03
1965	6.30	-3.57	3.07	-4.65
1966	0.39	1.21	2.69	-3.77

$$\frac{c_{jt} - r_{jt}^*}{c_{jt}} \times 100$$

With quarterly consumption expenditure data representing a major economic indicator, a collateral forecasting equation was developed to facilitate the timely evaluation of changing trends in the economy. A number of alternative specifications were tested and the auto-regressive relationship (equation 11) was selected on the basis of its statistically optimal properties relevant to short and medium term forecasting. Data for

the observation period 1st quarter 1957 to 4th quarter 1966 were used to estimate the forecasting equation:

$$\begin{aligned}
 C_t = & 0.15555 + 0.44116 C_{t-1} + 0.62554 C_{t-2} \\
 & \quad (0.15567) \quad (0.16069) \\
 & - 0.52269 Q_{1t} - 0.23620 Q_{2t} \\
 & \quad (0.09690) \quad (0.06379) \\
 & - 0.27305 Q_{3t} \\
 & \quad (0.08968) \\
 & R^2 = 0.96 \quad \dots (11)
 \end{aligned}$$

where:

C_t : Consumer expenditures in Ontario during Quarter t .

C_{t-1} , C_{t-2} : Consumer expenditures in Ontario lagged one and two quarters respectively.

Q_{1t} , Q_{2t} , Q_{3t} : Quarterly seasonality variables, defined as:

$Q_{jt} = 1$ in the j^{th} quarter.

$= 0$ in all other quarters.

($j = 1, 2, 3$)

All the coefficients of equation 11 are statistically highly significant while the auto-regressive structure of the equation provides obvious advantages for forecasting purposes by confining the required input data to readily available exogenous variables. Reflecting the specific design for short to medium term forecasting the variance of the forecast increases with the time horizon implying an upper bound of approximately four quarters to the prediction period. Specific forecasts for the first three quarters of 1968 based on equation (11) are presented in the Appendix.

Table A-1 — Consumption Expenditure per Capita by Province, Canada, 1957 to 1967

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
	Dollars										
Newfoundland	731	757	780	821	865	879	921	963	1,052	1,145	1,254
Prince Edward Island	727	820	861	922	866	962	1,000	1,112	1,231	1,220	1,389
Nova Scotia	937	975	1,013	1,041	1,073	1,117	1,152	1,204	1,296	1,362	1,488
New Brunswick	843	862	887	941	962	1,000	1,033	1,115	1,205	1,279	1,408
Quebec	1,055	1,096	1,111	1,142	1,197	1,250	1,292	1,362	1,460	1,548	1,658
Ontario	1,406	1,455	1,478	1,498	1,525	1,594	1,672	1,734	1,850	1,966	2,039
Manitoba	1,154	1,263	1,283	1,322	1,291	1,434	1,428	1,511	1,598	1,708	1,847
Saskatchewan	1,030	1,103	1,140	1,296	1,069	1,463	1,601	1,431	1,659	1,872	1,849
Alberta	1,234	1,334	1,334	1,339	1,370	1,456	1,494	1,520	1,662	1,857	1,951
British Columbia	1,436	1,443	1,483	1,492	1,519	1,574	1,645	1,712	1,865	1,980	2,050
Canada (DBS)	1,208	1,244	1,292	1,317	1,341	1,396	1,455	1,542	1,638	1,749	1,848

Table A-2 — Consumption Expenditure per Capita by Region, Ontario, 1957 to 1967

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
	Dollars										
Metropolitan	1,773	1,856	1,832	1,854	1,905	1,958	2,037	2,089	2,197	2,302	2,389
Niagara	1,537	1,525	1,584	1,577	1,604	1,694	1,792	1,878	2,009	2,097	2,198
Eastern Ontario	1,185	1,224	1,258	1,292	1,338	1,392	1,453	1,502	1,596	1,711	1,802
Northeastern Ontario	1,336	1,314	1,353	1,344	1,313	1,370	1,378	1,408	1,474	1,540	1,591
Lake St. Clair	1,237	1,264	1,324	1,359	1,325	1,413	1,514	1,602	1,821	1,858	1,962
Lake Erie	1,099	1,248	1,296	1,319	1,350	1,394	1,520	1,560	1,675	1,810	1,917
Mid-Western Ontario	1,213	1,239	1,289	1,331	1,339	1,444	1,534	1,610	1,710	1,822	1,919
Lake Ontario	1,010	1,056	1,082	1,080	1,083	1,171	1,240	1,268	1,367	1,442	1,512
Northwestern Ontario	1,374	1,356	1,356	1,379	1,376	1,411	1,405	1,484	1,603	1,608	1,660
Georgian Bay	818	885	908	905	935	1,022	1,081	1,172	1,269	1,358	1,451
Province	1,406	1,455	1,478	1,498	1,525	1,594	1,672	1,734	1,850	1,966	2,039

Table A-3 — Provincial Consumption Functions

	a_i	b_i	R^2
Newfoundland	0.0346	0.8898 (0.0329)	0.99992
Prince Edward Island	0.0091	0.8736 (0.0386)	0.99955
Nova Scotia	0.0615	0.8765 (0.0135)	0.99997
New Brunswick	0.0505	0.8773 (0.0374)	0.99993
Quebec	0.3769	0.8835 (0.0351)	0.99997
Ontario	0.4211	0.8805 (0.0362)	0.99997
Manitoba	0.0733	0.8756 (0.0380)	0.99996
Saskatchewan	0.0841	0.8680 (0.0409)	0.99999
Alberta	0.0878	0.8836 (0.0351)	0.99991
British Columbia ¹	0.1101	0.8817 (0.0358)	0.99998
Canada (DBS series)	1.5662	0.8720 (0.0393)	0.99754

¹Includes Yukon and Northwest Territories.

Table A-4 — Regional Consumption Functions

	a_j	b_j	R^2
Metropolitan	0.0890	0.8880 (0.0383)	0.99988
Niagara	0.0532	0.8785 (0.422)	0.99996
Eastern Ontario	0.0516	0.8845 (0.0397)	0.99999
Northeastern Ontario	0.0231	0.8981 (0.0342)	0.99953
Lake St. Clair	0.0365	0.8746 (0.0439)	0.99997
Lake Erie	0.0306	0.8778 (0.0425)	0.99998
Mid-Western Ontario	0.0247	0.8843 (0.0398)	0.99996
Lake Ontario	0.0275	0.8757 (0.0434)	0.99990
Lakehead-Northwestern	0.0162	0.8782 (0.0423)	0.99989
Georgian Bay	0.0283	0.8714 (0.453)	0.99994
Province	0.3855	0.8837 (0.0401)	0.99994

Table A-5 — Consumption Expenditures, 1965

	Set 1	Set 2	Set 3
	\$ Million		
Newfoundland	513.471	509.565	518.035
Prince Edward Island	132.562	131.431	133.373
Nova Scotia	982.391	975.689	990.152
New Brunswick	745.645	739.859	751.457
Quebec	8,186.936	8,175.323	8,189.078
Ontario	12,476.672	12,498.020	12,452.591
Manitoba	1,546.834	1,540.948	1,554.713
Saskatchewan	1,588.478	1,584.357	1,592.453
Alberta	2,418.761	2,416.346	2,419.868
British Columbia	3,370.076	3,380.409	3,369.183
Northwest Territories	48.320	48.639	48.341

Table A-6

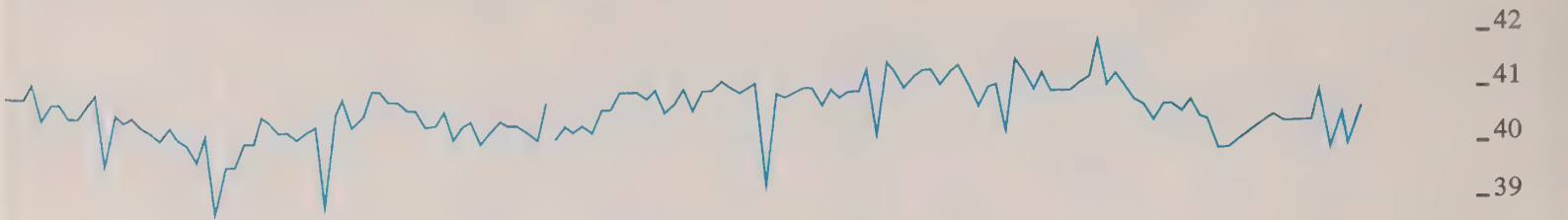
Forecast values of consumer expenditure in
Ontario by quarters, 1968:

	\$ Billion
First Quarter:	3.67
Second Quarter:	4.14
Third Quarter:	4.00

Selected Economic Indicators

Leading Indicators

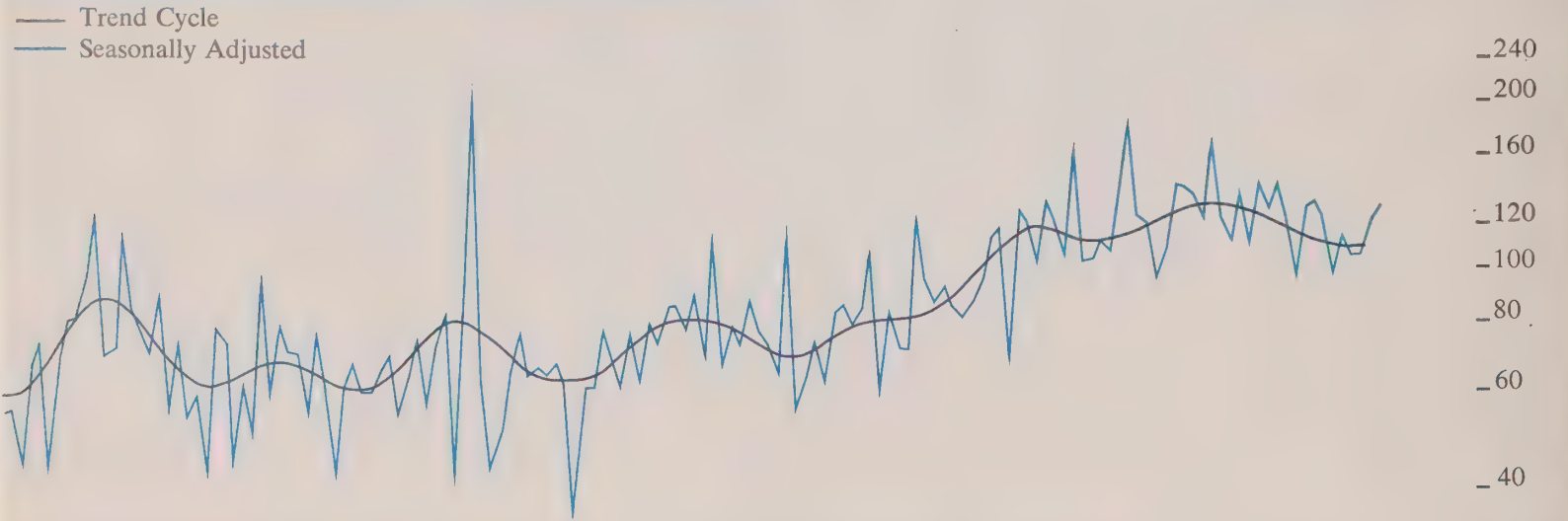
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



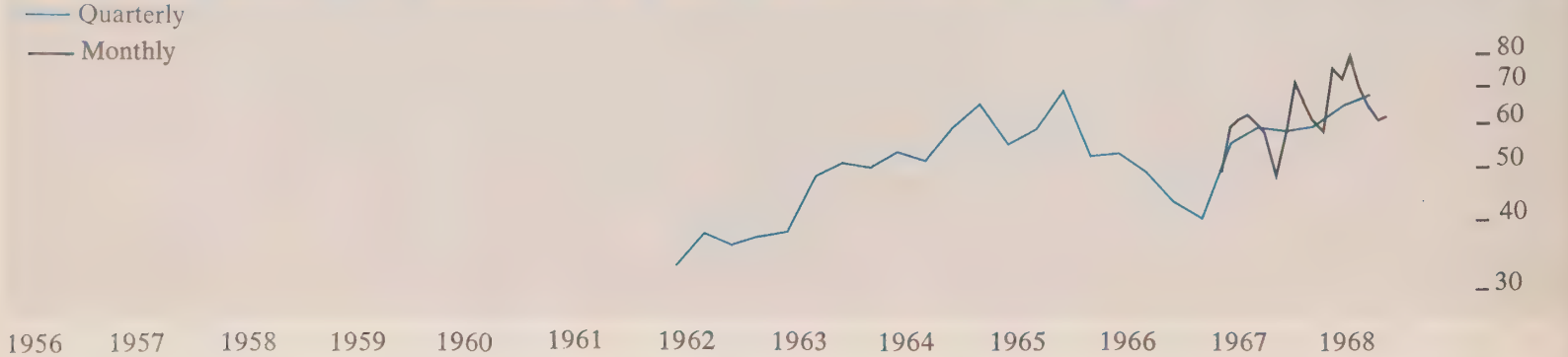
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Business, Industrial and Engineering Construction Contracts, Ontario



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion

Scale L1

25

20

15

14

13

12

Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index

1956 =

100

Scale L2

160

140

120

100

Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion

Scale L1

— Current Dollars

— Constant (1957) Dollars

60

50

40

30

Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

\$

Scale L1

3.00

2.50

2.00

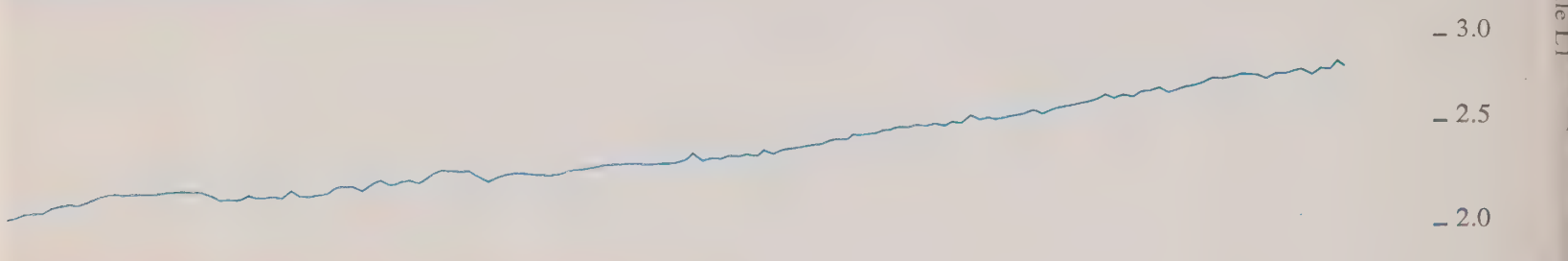
1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



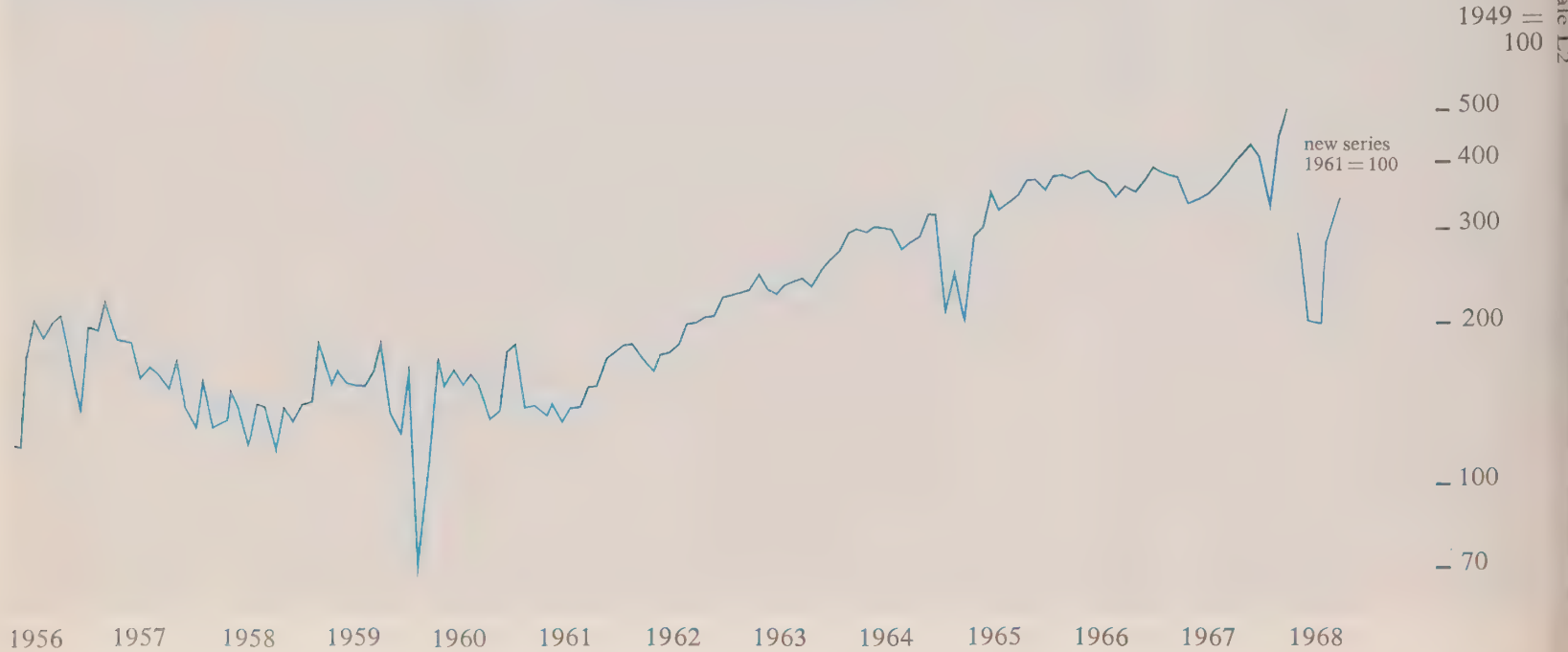
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)



Economic Indicators

17

Seasonally Adjusted

		1967							1968						
		June	July	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Leading Indicators															
Average Weekly Hours Worked in															
Manufacturing	Number	40.4	40.5	40.4	40.4	40.4	40.4	40.9	39.9	40.5	39.6	40.6			
New Orders in Manufacturing Industries ^c	\$ Million	3,117	3,242	3,107	3,161	3,178	3,118	3,308	3,215	3,079	3,078	3,203	3,353	3,264	
Business, Industrial and Engineering Construction Contracts	\$ Million	129.0	129.3	121.6	99.2	129.7	133.0	125.4	99.3	114.5	105.1	105.4	122.6	128.7	
Urban Housing Starts	Number	57,800	48,900	57,500	72,100	66,100	61,000	58,700	76,600	72,700	79,400	69,200	63,200	60,800	61,900
Money Supply ^c	\$ Million	22,614	22,797	23,191	23,755	23,839	24,041	24,147	24,149	24,479	24,682	24,972	24,987	25,400	25,846
T.S.E. Industrial Index ^a	1956 = 100	164.54	169.66	166.85	168.72	157.39	161.60	162.28	157.43	150.24	146.88	160.43	157.87	166.61	165.93
Business Failures ^a	Number	59	52	26	34	79	43	73	54	59	87	52	50	46	
Business Failures - Liabilities ^a	\$ Million	2.9	3.2	4.1	2.6	16.6	2.9	24.3	2.6	1.8	5.6	6.4	2.8	6.6	
Coincidental and Lagging Indicators															
Gross National Product ^c (Annual Rate)	\$ Million	62,072			62,372			62,992			64,912			66,396	
Average Hourly Earnings in Manufacturing	\$	2.51	2.55	2.56	2.56	2.58	2.58	2.60	2.59	2.58	2.60	2.67			
3-Month Treasury Bill Rate ^{a,ii}	Per Cent	4.28	4.32	4.34	4.76	4.95	5.46	5.95	6.29	6.80	6.98	6.99	6.95	6.56	
Cheques Cashied in Clearing Centres ⁱ	\$ Million	5,154	5,121	4,983	5,133	5,081	5,459	5,485	5,006	4,959	5,313	5,031	5,448		
Retail Trade	\$ Million	761	739	761	777	762	773	767	803	768	780	785	779	804	
Labour Force	000's	2,844	2,862	2,860	2,851	2,853	2,860	2,856	2,857	2,892	2,869	2,890	2,918	2,962	2,948
Employed	000's	2,750	2,767	2,763	2,762	2,746	2,764	2,762	2,769	2,793	2,760	2,796	2,796	2,844	2,825
Unemployed	000's	94	95	97	89	107	96	94	88	99	109	94	122	118	123
Unemployed as % of Labour Force	Per Cent	3.3	3.3	3.4	3.1	3.8	3.4	3.3	3.1	3.4	3.8	3.3	4.2	4.0	4.2
Wages and Salaries	\$ Million	1,053	1,064	1,071	1,075	1,070	1,086	1,094	1,109	1,103	1,107	1,130	1,135		
Index of Industrial Employment	1961 = 100	124.4	124.9	124.6	124.6	124.4	125.7	125.8	126.1	124.3	125.2	125.6			
Index of Industrial Production ^c	1961 = 100	151.0	150.5	153.2	152.4	151.1	154.5	156.8	153.8	153.9	154.9	156.8	158.4	160.1	
Total Manufacturing ^c		150.4	150.7	152.7	152.3	149.9	153.9	156.6	153.0	152.2	154.0	156.4	158.1	159.6	
Non-Durables ^c		137.4	136.6	137.4	138.4	137.6	139.3	140.1	138.8	141.9	145.7	143.5	142.8	145.7	
Durables ^c		166.3	168.0	171.4	169.2	165.0	171.8	176.7	170.4	164.8	164.2	172.2	176.8	176.6	
Mining ^c		147.4	142.1	148.3	147.8	149.1	150.8	152.2	145.8	152.8	152.4	153.3	153.1	155.4	
Electric Power and Gas Utilities ^c		161.5	162.0	164.5	160.6	164.0	165.4	165.5	172.9	170.0	166.6	165.7	169.1	172.1	
Primary Energy Demand (Annual Rate)	BKWH	50.70	50.64	51.61	50.98	52.41	53.86	53.78	55.60	55.15	54.01	53.94	53.81		
Exports (including re-exports) ^c	\$ Million	962.6	914.5	925.2	861.3	956.7	969.4	1,023.0	1,077.7	1,140.4	1,125.7	1,165.3	1,097.2	1,104.2	
Imports ^c	\$ Million	893.5	928.6	900.1	921.8	889.5	882.5	928.7	974.5	1,093.9	970.9	1,026.6	993.0	959.7	
Unclassified Indicators															
Foreign Exchange Reserves ^{c,ii}	U.S. \$ Million	2,169	2,183	2,198	2,221	2,303	2,277	2,268	2,175	2,490	2,244	2,416	2,695	2,574	
Industrial Materials Price Index ^{c,ii}	1935-39 = 100	256.7	253.0	252.0	251.2	250.1	252.9	254.3	253.5	252.4	253.0	251.2	255.5	259.9	
Consumer Price Index ^{c,ii}	1949 = 100	148.8	150.2	150.9	150.7	150.5	151.0	151.8	152.6	152.7	153.2	154.1	154.2	154.7	155.6

^cStatistics for Canada.

ⁱⁱNot seasonally adjusted.

ⁱOntario less Toronto.



Ontario Economic Review

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Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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The Ontario Economy

Development of Information Flows for Economic and Financial Policy Formulation

O. M. Schnick, Executive Director,
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About the Review

The feature article for the November-December edition of the *Ontario Economic Review* describes the need for, and development of, a central system of statistical information flows to provide data required for economic and financial planning, as well as informed Government policy formulation.

Some of the statistical applications currently under development include the census of industry surveys, the Census of Forestry, a continuing survey of conventional mortgage registrations and the Municipal Assessment Survey. In the latter, the Province of Ontario is encouraging all municipalities to adopt a standardized form of dealing with assessment and related statistical data such that a fully computerized system will evolve.

The article represents an expanded version of an address delivered to the Southern Ontario Chapter of the American Statistical Association by Mr. O. M. Schnick, Executive Director of the Economic and Statistical Services Division, Department of Treasury and Economics. The author acknowledges with appreciation the contribution of Mr. E. P. McCoy of the Ontario Statistical Centre and other divisional staff members in the preparation of this article.

Indicator Charts, Pages 10-12

Fluctuations in aggregate economic activity – commonly used to define business cycles – do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate – because they relate to future rather than present production – are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 10-12 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used – 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) – only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

Construction:

Ontario's construction activity in September and October expressed in terms of contracts awarded (not seasonally adjusted), as recorded by *Southam Building Guide*, increased by 6.9 per cent and 16.1 per cent respectively over the corresponding months in 1967. In September and October, the value of contract awards was \$199.3 million and \$233.3 million respectively compared with \$170.4 million and \$201.1 million in the same months last year.

In September, the latest month for which comprehensive data are available, all construction categories showed significant improvement with the exception of engineering awards which were down by 48.6 per cent from September 1967. Industrial contract awards showed the greatest advance, rising to \$18.4 million, up 84.1 per cent from September 1967. Business construction awards also improved significantly over the same month last year, increasing by 58.2 per cent to \$28.1 million. Residential construction awards totalled \$94.8 million, an increase of 31.1 per cent.

In spite of the increased value in September, the total value of construction awards for the first nine months of 1968 is 5.3 per cent below the corresponding value for 1967. In the January to September period this year Ontario's total construction contract awards reached \$1,671 million, down \$93.5 million from the value of \$1,764 million recorded during the same period in 1967. Reduced total values were registered in industrial

awards, down 22.0 per cent to \$189.0 million and engineering contract awards down significantly by 43.7 per cent to \$234.8 million. Buoying up the overall total for the first nine months of 1968 has been the 55.9 per cent increase in business construction awards, rising from \$139.4 million to \$217.4 million and the moderate increases of 8.2 per cent and 5.6 per cent respectively for residential and institutional contract awards.

Large construction awards for the month of September, each valued at \$1.0 million or more totalled \$67.3 million. Some are listed below.

In terms of actual housing construction, the number of dwelling unit starts in Ontario centres of 10,000 population and over was 4,581 in September, 30.8 per cent less than in September 1967. This is also down 30.4 per cent from the August 1968 total of 6,586. However, the cumulative total for the first nine months of 1968 was 49,055, 8.5 per cent higher than the same period last year. September starts in Toronto at 1,705, were down 60.8 per cent from September 1967, but brought the cumulative nine month total to 26,807, an increase of 7.5 per cent over the January to September period last year. Of the larger centres, Brampton, Kingston, London, Ottawa, Kitchener, Windsor and Metropolitan Toronto had fairly substantial cumulative increases, ranging from 99.0 per cent for Brampton to 7.4 per cent for Metropolitan Toronto. The greatest numerical decrease occurred in Hamilton (over 400 or

10.7 per cent) followed by St. Catharines (301 or 24.0 per cent).

Dwelling unit completions in Ontario centres of 10,000 population and over numbered 5,632 in September bringing the nine month total for 1968 to 39,426 – up 10.8 per cent from the January to September period of 1967. With the exception of Kingston, Oshawa, Sault Ste. Marie, Metropolitan Toronto and Windsor most centres have had a greater number of housing completions this year. At September 30, 1968, there were 52,986 dwelling units under construction in Ontario, 17.4 per cent more than the 45,113 units under construction one year earlier.

Federal Budget – 1968-69

Finance Minister Edgar Benson presented his first budget to Parliament on October 22, 1968. Reviewing the current economic setting Mr. Benson described the Canadian economy as accelerating moderately in a period of widespread prosperity, but not without problems. Encouraged by increases in production, national income, exports and housing investment, Mr. Benson nevertheless expressed serious concern at the extent of unemployment and the rate at which prices are increasing. In addition, he said that although the Canadian balance of trade this year has been better than expected our capital markets continue to be subject to serious strains primarily reflected in high interest rates.

Outlining the federal government's fiscal position Mr. Benson revealed that spending for the current year, at \$10,780 million, is \$480 million above original expenditure intentions proposed in the last budget of November 30, 1967 and \$109 million higher than the figure in the revised estimates in September. Revenues for this year, before taking tax changes into account, are estimated at \$10,050 million or \$135 million less than earlier projections. On this basis the deficit will total \$730 million compared with a deficit of \$486 million indicated by the revised estimates and a deficit of \$40 million or less promised by Mr. Benson five months ago. Faced with this significant discrepancy between expenditures and revenues, the Finance Minister has decided to cover almost the whole of the deficit through borrowing. Tax increases will provide only \$55 million in the remainder of the current year, reducing the proposed deficit to \$675 million. In addition, apart from foreign exchange fund transactions, Mr. Benson predicted that the

Large Construction Awards Placed Recently in Ontario

Location	\$ Million	Description
Brampton	\$10.0	Shopping Centre
Chinguacousy Twp.	\$ 1.5	School
Eastview	\$ 1.3	Home for Aged
Etobicoke	\$ 2.5	Warehouse and Offices
Kitchener	\$ 1.7	Apartments
Mississauga	\$ 2.9	Apartments
Niagara Falls	\$ 1.2	City Hall
Ottawa	\$ 7.9	Apartments
Ottawa	\$30.5	Commercial Complex
Port Arthur	\$ 2.6	University Centre
St. Catharines	\$ 3.4	College Addition
Stratford	\$ 1.4	Nursing Home
St. Thomas	\$ 1.5	Home for Aged
Toronto (metro)	\$23.4	Apartments
Windsor	\$ 1.0	Apartments

Source: *Southam Building Guide*.

Government, in the current fiscal year, will have net extra-budgetary requirements of \$600 million. This must be added to the budgetary deficit of \$675 million and yields a total cash requirement of \$1,275 million compared with the maximum of \$750 million promised by the Government in the 1967 fall budget.

In the fiscal year to date, the Government has raised approximately \$600 million in new money, after taking account of refundings of market bonds and redemptions of Canada Savings Bonds. This leaves \$675 million still to be raised. Most of this money can be expected to be raised through the sale of the 1968 series savings bonds which have been offered on very attractive terms.

The major adjustment in the Government's fiscal position has been postponed to the next fiscal year when an \$845 million increase in revenues resulting from tax changes will, according to Mr. Benson, bring the budget into balance.

The main tax changes are:

- A new Social Development tax of two per cent on personal income will be imposed as of January 1, 1969 and limited to a maximum of \$120 on each taxpayer. This is, in effect, merely an increase in the regular income tax and is approximately equivalent to an increase of nine per cent across the board. The new tax with its limit of \$120 per taxpayer is quite regressive. For a married man with two children earning \$7,000 a year, the cost will be an additional \$86 a year, or a tax increase of 10.2 per cent over the previous year. A man with the same size family but earning \$25,000 a year and subject to the full increase of \$120 will experience a tax increase of only 1.5 per cent. This tax is expected to bring in revenue of \$440 million in the full year, 1969-70. Provincial Treasurer C. S. MacNaughton estimates that approximately \$225 million of that amount will come from Ontario. The revenue from the two per cent surcharge, unlike that from the general income tax, will not be shared with the provinces.
- The Carter recommendations for taxation of life insurance companies are implemented with minor changes. Effective January 1, 1969, with some excep-

tions, the general provisions of the Income Tax Act will apply to life insurance corporations to yield \$40 million in revenues next year, \$5 million for the old age pension fund and \$10 million for the provincial share of tax. In addition, a 15 per cent tax will be imposed on part of the investment income earned by the companies, to yield the federal treasury an additional \$40 million next year. The investment income on insurance policies realized by a policyholder through cashing in or selling a life insurance policy is to be included in his taxable personal income for 1969 and subsequent taxation years.

- Corporation tax payments will again be speeded up to increase revenues next year by \$275 million, \$27 million for the pension fund and \$28 million for the provinces. Instalment payments of corporate income taxes are to start in the first month of a fiscal year. During the transition to this new payment pattern, each company will have to pay two additional monthly instalments within one fiscal year.
- Tax deductible reserves allowed to banks and mortgage loan companies will be cut in half, to raise \$45 million in 1969-70.
- Estate and gift taxes have been reformed to completely remove levies on transactions between husband and wife but additional adjustments have been made to maintain the level of revenue.
- Effective for the 1969 taxation year, expenses paid under a medical insurance plan will not be allowed as deductions under the Income Tax Act if reimbursement was made under the federal-provincial medical care insurance plan.

Employment

The seasonally adjusted Ontario labour force rose to 2,959 thousand in September, an increase of 3.7 per cent over September 1967. At the same time the number employed reached 2,858 thousand – 3.4 per cent more than twelve months earlier. The rate of unemployment in the Province – 3.4 per cent – was slightly higher than that of 3.1 per cent recorded for September 1967.

In terms of change from the previous month the size of the labour force increased by 22,000 from 2,937 thousand in August to 2,959 in September. The number employed rose to 2,858 thousand from 2,837 thousand an increase of 21,000. Unemployment thus rose marginally from 100 thousand to 101 thousand and the rate of unemployment remained unchanged at 3.4 per cent.

Although the pace of Ontario's economic activity quickened in the first months of 1968 in response to sustained consumer demand and brisk export trade, employment failed to expand proportionally and resulted in only moderate employment gains. With the settlement of the international gold crisis, improved Canadian reserves, a strengthened Canadian dollar and a moderate reduction in interest rates business confidence was greatly restored and the outlook for the second half of 1968 indicated higher sales and profit levels. However, to remain competitive in the face of rising labour costs many companies chose to maintain their work forces at present levels and to substitute labour-saving machinery for manpower. In consequence employment gains have been moderate.

In the first nine months of 1968, Ontario's labour force averaged 2,914,000, up 3.0 per cent from the comparable figure for 1967. This is a lower growth rate than last year. The reduced rate of labour force growth is expected to continue during the remainder of 1968 and is partially attributable to a smaller influx of immigrants. During the first half of 1968, 45,799 immigrants indicated Ontario as their destination, 21.3 per cent fewer than the same period in 1967. Another factor contributing to reduced labour force growth results from longer attendance in educational institutions of potential labour force participants. Large numbers of students swell labour ranks each summer but as a result of almost static employment conditions this year a larger than usual number may have returned to school this fall in an effort to improve their employment bargaining position.

Statistics from all of Canada indicate that unemployment dropped from 5.1 per cent in August to 4.8 per cent in September. In September of 1967 this rate was 4.1 per cent. Canada's unemployment rate for the first nine months of 1968 has averaged 4.8 per cent compared with 4.0 per cent for the same period last year.

THE CONFEDERATION DEBATE

As a contribution to greater public understanding of the continuing debate on Confederation, the Department of Treasury and Economics is pleased to announce the availability of the following publications:

Confederation of Tomorrow Conference Proceedings

This is the full record of the important conference of provincial premiers and prime ministers held in Toronto in November 1967. The meeting, the first of its kind to be open to the mass media, was the prelude to the Federal-Provincial Constitutional Conference in Ottawa in February 1968. The record includes a foreword by the Honourable John P. Robarts, Prime Minister of Ontario, and, as an appendix, the Preliminary Statement of the Province of Quebec.

Available in either English or French. Each \$4.00

Confederation of Tomorrow Conference Theme Papers

The five papers in this volume were prepared to provide some background material for the discussion of the major themes on the agenda of the Conference. The contents did not and do not necessarily represent policies of the Government of Ontario. The degree of interest aroused by the Conference has led to many further requests for the papers. This second edition, which combines in one volume the original and separate English and French versions, is designed to meet this demand. *Each \$2.00*

Quebec in the Canada of Tomorrow

This volume is an English version of a special supplement to *Le Devoir* of June 30, 1967. Mr. Claude Ryan, the editor of *Le Devoir*, brought together many writers, both French and English

to contribute articles on issues concerning the role of Quebec in Canada. The volume provides a useful insight to the ideas expressed by many Canadians, but especially by French-speaking Canadians, on some of the more contentious contemporary issues in Canada.

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The studies in this volume, prepared by and for the group of distinguished Canadians who constitute the Advisory Committee, are an important contribution to an understanding of the contemporary problems of Canadian federalism. Among the subjects included are: the Canadian Supreme Court; the provinces and international relations; a federal capital territory; constitutional amendment; changes in Quebec's status.

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Development of Information Flows for Economic and Financial Policy Formulation

O. M. Schnick, Executive Director,
Department of Treasury and Economics

Introduction

With the growing complexity of economic and social interdependence characteristic of an expanding industrial-urban society, the Ontario Government has found it increasingly necessary to assume a multiplicity of research and information-generating functions in support of economic and financial planning. As a consequence, the acquisition and compilation of many diversified series of statistical data at both the provincial and sub-provincial levels assumes growing importance. This information is essential to the development of a factual basis for interpretative economic studies designed to assist in policy formulation and decision-making within the Government. In addition, the continuous flow of statistical and descriptive data made available to the business community and the public at large permits a better understanding and appraisal of the changing economic environment.

This article places considerable emphasis on the development of information flows by the Economic and Statistical Services Division within the Department of Treasury and Economics. Reference is made to traditional sources of statistical data as well as the need to develop new information series and to cultivate new statistical sources both within government and the industrial community under relevant statistical legislation.

The Ontario Statistics Act provides the legal basis for the collection and compilation of statistical information through the Ontario Statistical Centre, a unit within the Economic and Statistical Services Division. The annual Census of Manufactures returns is a prime example of a major information flow developed by the Division in co-operation with the Dominion Bureau of Statistics under the authority of the Federal and Provincial Statistics Acts.

To develop and meet the functional requirements of a smoothly flowing information system the Economic and Statistical Services Division is structured in terms of three major operational units. While the general objectives of the Division are directed toward the development and maintenance of a central system of statistical information flows in support of a program of comprehensive economic analyses, each of the three units has particular functions within the framework of the system.

The Ontario Statistical Centre is primarily involved in the selection of statistical and economic data which meets well defined criteria. Of cardinal importance is the adapt-

ability of data to computer and data processing facilities, while in many instances the Centre is able to modify existing statistical data files to create the degree of standardization necessary in meeting user needs. In order to accomplish the primary role of statistical acquisition, the Centre exerts a co-ordinating influence upon the statistical activities of the departments and agencies within the Ontario Government, thus making possible the development and implementation of well defined statistical standards in government operations. As a result of this activity, the Centre is also in a position to assist these departments in consolidating their statistical needs for presentation to the Dominion Bureau of Statistics at periodic Federal-Provincial conferences on economic statistics. In addition, all current and prospective statistical activities under the Ontario Statistics Act are subject to continuing review and assessment.

The Economic Analysis Branch utilizing information supplied by the Centre, provides economic research services to the Policy Planning Division and other government agencies through the development and application of advanced mathematical and statistical techniques to economic analysis. The Branch is engaged in the design and development of an integrated model of the Ontario economy and its major sub-sectors and as well, will provide detailed and comprehensive long-term economic forecasts based on Input-Output analysis. These forecasts will be supplemented by quantitative assessment of policy alternatives with a view to assisting in the formulation of governmental economic policy.

The Systems and Programming Branch, the third major unit in the Division, is charged with the establishment of an effective interface between the basic statistical operation and the electronic data processing facility. Accordingly, it provides computer systems and programming services in support of economic and financial research within the Department as well as major administrative and budgetary programs having government-wide application. Keeping in mind the importance of interface with data banks which will be developed at the provincial and federal levels in the future, the unit also assists and participates in the establishment and maintenance of computer programming standards among government departments and agencies.

The need for a continuing expansion of statistical information services is well illus-

trated by a statement of the Chairman of the Economic Council of Canada: "To a growing extent, the modern economy is coming to run on knowledge and information which needs to be taken into account in economic decision making at all levels, whether by consumers by private producers and distributors or by governments. Moreover, to use this resource most effectively in our modern society the information inputs cannot in most cases be raw or casual information. To be really useful, information needs to be organized, a processed, a worked-over product; it must be in readily applicable form. It needs to be accurate. It needs to be available in a timely way. And it needs to be relevant to decisions."¹

Ontario Statistics Act

While a broad range of economic statistics has been collected on a continuing basis by the Dominion Bureau of Statistics the emphasis, despite the release of numerous provincial aggregates, has been on the presentation of national-type data. In response to the growing need by government and the industrial sector in Ontario for more accurate and detailed statistics at both provincial and sub-provincial levels, legislation was effected to facilitate the acquisition of statistical information at questionnaire level. This legislation, termed the Ontario Statistics Act 1962-63, enables the Ontario Statistical Centre to collect, compile, analyze, publish and store statistical information.

Specifically, the Act provides for a number of measures designed to improve the province's statistical operations. Firstly, it facilitates and formalizes the province's entry into co-operative statistical arrangements with other government agencies, in particular, the Dominion Bureau of Statistics. Provision is made for either joint participation with the Bureau on a selected questionnaire basis or the acquisition of a duplicate of the original DBS questionnaire such as now pertains with respect to the Census of Manufactures.

The inclusion of confidentiality and punitive clauses in the Ontario Statistics Act comparable with those in the Federal Statistics Act makes possible the development of new data for analytical purposes at provincial and economic regional levels. Statistical information obtained in disaggregated form under the Act thus facilitates the preparation of feasibility studies and the formulation of policy measures on a regional and sub-regional basis. Secondly, the Act enables

¹As quoted by the Honourable Paul Martin, Senate Debates, October 8, 1968, p. 224.

the Centre to collect or jointly, with other departments, gather statistical information by questionnaire from field sources.

An additional feature of the Ontario Statistics Act worth noting is that it provides for a degree of co-ordination in activities carried out under the Act without creating an undue measure of control by the Statistical Centre over the statistical operations of other government departments. Effective co-ordination is indispensable in ensuring efficient statistical operations by Ontario Government agencies under this Act. Understandably, duplication or overlapping of survey work could result in a waste of financial resources as well as placing an unnecessary reporting burden on the respondent.

For these reasons, the Act specified that every proposal or action contemplated under this legislation shall be submitted to the Treasurer of Ontario and Minister of Economics for review and report purposes. This provision eliminates attempts to secure information which can be obtained more efficiently by other means, is not essential to the project concerned, or cannot be processed within the anticipated period of time.

As further statistical programs are developed and carried out under the Act, the increasing flow of statistical data, together with the need to provide timely information in a wide variety of forms for analytical and interpretative purposes, makes mandatory the creation of computerized data flows within the framework of a Central Information System.

Central Information System

An adequately specified Central Information System must be designed to meet the multiple needs of economists and statisticians concerned with the development of analytical techniques such as Input-Output analyses, econometric models and other quantitative procedures. There is no doubt that the foregoing presents a formidable challenge and will require the implementation of the most sophisticated and advanced technology available.

At present, compilations of statistical data are directed at an evaluation of the functional structure of the Ontario economy in terms of prices, employment, output and other key variables. Many of these statistical series are constructed to support specific research programs, the data being obtained by special surveys designed to meet the more immedi-

ate requirements of particular departments or agencies. An examination of the rapid economic expansion in Ontario highlights the need to further improve information flows, particularly in terms of annual statistics. Selected population and labour force characteristics, land use and land inventory data as well as housing information, available for intercensal years on a small urban area basis, represent just a few of the statistical areas to which the Division attaches developmental importance.

Although there is a wealth of administrative data available within the Government organization, it is most desirable that appropriate procedures be developed to make this information available in readily usable and standardized form. At present, differences in collection methods, tabulating procedures and terminology make it difficult to obtain maximum utilization without considerable time and effort. In some cases, administrative data are obtained by sampling procedures designed to arrive at reliable estimates of specific activities. While this method is most useful as a technique for generating statistics in terms of cost consideration, the quality of the output is directly related to the design of the sampling procedure.

The concept of a Central Information System in conjunction with a data bank operating under rigorous standards ensures a higher degree of utilization of data through the provision of maximum flexibility and the maintenance of basic data input in as fine detail or classification as possible. The value of the Central Information System is dependent upon its ability to satisfy the needs of policy planners and administrators. In order to make this possible the system must be able to access a highly diverse type of statistical data at an increasingly fine level of disaggregation. With this objective in mind the Division is giving particular attention to the selective development of three main information flows: economic type data derived from the general industrial sector of the province through the use of field respondent questionnaires mailed to manufacturers in the province on an annual basis; financial data on government expenditure and revenue for budgetary purposes; and data derived from the administrative or operational activities of government departments.

Currently, the Division is placing emphasis on the acquisition of selective economic data required for quantitative economic analyses

carried out in the Economic Analysis Branch and the Policy Planning Division. However, it is apparent that economic research must frequently make use of financial and administrative data not readily obtainable from conventional sources. In such cases financial and administrative records maintained by the various departments of government provide a potential source of relevant information. In view of the increasing importance of such data for economic analysis and policy planning, it will be possible with a data bank to place the collection, storage and retrieval of this type of information on a more adequate basis.

The application of electronic data processing techniques will allow the finely disaggregated data inputs to be grouped into as many special purpose classifications and aggregations as required. Loss of information due to confidentiality restrictions will be greatly reduced under the data bank concept. With detailed information stored in a data bank facility, it would be possible through computer program instruction to generate output as required without contravening rules of disclosure. The use of the data bank facility where edits and confidentiality checks relating to disclosure are performed upon fully processed data will facilitate the flow and exchange of information among the various units of government.

In developing the Central Information System, care will be exercised to ensure that all data stored in the bank have been selected in accordance with priorities determined by the requirements of potential users. The development of these selectivity factors will require an understanding of the statistical needs not only of government departments but other agencies as well. The Ontario Statistical Centre, created initially to provide an advisory service for the administration of the Ontario Statistics Act will ensure the acquisition of statistical data to meet these requirements. It is in these two areas primarily that the Centre can assume a vital role in the development of the Central Information System. In brief, the Ontario Statistical Centre is charged with responsibility for the following functions:

1. to collect, compile, analyze, publish and store statistical information obtained under the terms of the Ontario Statistics Act,
2. To serve as a central clearing house for major economic and financial data,

3. to assist the departments of government in collecting, compiling and publishing statistical information,
4. to provide liaison between the Ontario Government and the Dominion Bureau of Statistics and coordinate statistical activities among the Provincial Departments,
5. to carry out applied statistical research and develop operational standards, and
6. to assist in developing a data bank oriented Central Information System designed to provide data for economic and financial policy planning purposes.

Procedures are being designed in terms of data inputs to guide the initial selection and future accessibility of data bank contents. Techniques are also being developed for the conversion of existing files and production data into a form suitable for storage and retrieval, ultimately through the use of remote terminals. Lastly, data transfer to the bank must be effected without loss of information due to screening for confidentiality — a major requirement if the data bank is not to be limited to the inclusion of only non-confidential material, thereby reducing the major value of the system. Therefore, all confidentiality checks will be applied during the output phase rather than in the input stage.

The development of high standards for ensuring quality of data and their maintenance must be considered a major function of the system. With the rise of data banks at both the federal and sub-provincial level, standardization with respect to coding and classification is mandatory if we wish to take full advantage of the information they contain. Our ability to fully utilize such data bank facilities will depend on the development of sound interface techniques as well as criteria for the periodic review of data value in terms of continuing use, keeping in mind the need to purge information where storage may no longer be warranted. In brief, the statistical unit will develop and apply standards consistent with the smooth operation and maintenance of an information system.

Having outlined a few of the major aspects of a Central Information System, it is appropriate to consider the types of service which the potential user might expect from the data bank.

(1) It should provide data in a form as requested in cases where the primary collecting agency is unable to supply either the

required detail or format. For example, if the user requests tape files while the originals exist in printed statement form, the system must have the capacity to effectively translate the output file to computer tape or to selectively create output records in more than one format.

(2) In cases where information originates in more than one reporting agency the data bank facility must be able to integrate and produce data in maximum feasible detail, subject to confidentiality and disclosure checks.

(3) The data bank will be operated in conjunction with a library of computer programs suitable for complex data manipulation and other data processing routines.

The Central Information System as outlined is considered instrumental in the continuous process of policy formulation in areas to which the Government must address itself in the socio-economic environment. The development of quantitative techniques suitable for economic analysis and policy formulation is rapidly surpassing the ability of statistical agencies to provide adequate data. As a consequence, the introduction of new methods for data acquisition, storage, manipulation and access are highly desirable. The proposed information system is not advanced as a solution for all information gaps or deficiencies which may exist but certainly can play a major role in ensuring maximum service capability on the part of the Division.

Recent surveys carried out at various levels of government in both Canada and the United States tend to support an integrated approach in consolidating financial and socio-economic data. In 1965 a survey was carried out by the Ontario Government to assess the need for and capabilities of the various electronic data processing equipment then in use. In this survey an attempt was made to determine the scope and quality of statistics as well as policy planning information required by the various departments of government together with potential computer application.

Among the conclusions yielded by the survey two findings in particular are relevant to the creation and development of an information system namely:

1. Many statistical series currently being used lack timeliness and comprehensiveness, and
2. Statistics and information conducive to effective decision-making are not always obtainable on demand.

These findings tend to indicate a need for new statistical data and support the development of a more sophisticated information system at provincial level. Recently, the Dominion Statistician announced the creation of a data bank facility at federal level which will provide economic data principally in the form of national and provincial aggregates to potential users in the government and business sectors. Accordingly, for illustrative purposes it might be useful to briefly describe some of the divisional statistical applications currently under development such as the census of industry surveys and the municipal assessment program.

Census of Manufactures

In response to the increasing need for accurate statistical information, the Ontario Statistical Centre has for the past few years been engaged in selectively appraising and developing statistical data which would prove of maximum usefulness to economic analyses. The most comprehensive and widely used survey in the Province of Ontario is the annual Census of Manufactures. This survey relates to basic industrial statistics such as materials and process supplies used, fuel and power consumed, goods purchased for resale, number of employees, salaries and wages, commodities sold or produced, and inventories. At present, the survey embraces over 14,000 establishments, covering 179 industries in 20 major industrial groupings within the province.

These data will form an integral component in a Central Information System, together with other sub-systems developed specifically to meet major economic and statistical requirements. The statistical information, generated by this questionnaire, meets a broad range of needs. For example, the data provide essential inputs for the econometric models, as well as the input-output table being developed in the Economic Analysis Branch. Other branches concerned primarily with economic policy planning, will use the data in the evaluation of economic trends and the formulation of economic policies. It should be emphasized that the formulation of industrial development policy measures for the province is greatly assisted by data derived from the Census of Manufactures.

The Ontario Government commenced the collection of Census of Manufactures reports with the Dominion Bureau of Statistics several years ago. This decision was made

as a result of strong representation, particularly from the central economic and statistical research units of the Department of Treasury and Economics. On the basis of these representations, the Government authorized the Statistical Centre to enter into an agreement with the Dominion Bureau of Statistics, under authority of the Federal and Provincial Statistics Acts, which enabled the editing, processing and compilation of statistics pertaining to Ontario manufacturing activities.

It was anticipated that the Ontario Statistical Centre, by undertaking this project, would produce more current and comprehensive manufacturing statistics, not only for the province as a whole, but also for smaller geographic or administrative areas within the province. Such detailed and special tabulations require comprehensive editing, and are not readily obtainable from the Dominion Bureau of Statistics. The relative importance of industries on a national scale over time is not necessarily consistent with that at provincial or sub-provincial levels.

Ontario's decision to participate directly in the Census of Manufactures was strengthened by the feeling that joint participation on the part of D.B.S. and Ontario, would have a positive effect in terms of ensuring a high quality of edited reports, a more complete coverage of manufacturing establishments and perhaps, a greater sense of co-operation by the respondents. It was also believed that by training and introducing its own field force for maintaining "in person" contact with respondents, Ontario could make a useful contribution toward obtaining quality statistics by ensuring that the limited field staff of the Ontario Statistical Centre would be prepared, when needed, to provide any assistance to respondents experiencing difficulties in the completion and submission of their industry returns.

In this way, a mutual understanding of the problems and needs of both may be more readily achieved. It is the intention of the Ontario Government to encourage and support, where possible, this personal approach in order that the field staff might gain a better understanding of the industrial production process and organizational structure of industry, while the individual firm will gain a new awareness of its role in providing the impetus and factual material upon which both short- and long-term economic projections can be built.

In soliciting statistical data, the respondents must have assurance that the informa-

tion submitted is safeguarded. The Ontario Government, through the Ontario Statistical Centre, is acutely aware of this need. As a result, the organization and data collection techniques have been formulated with the confidentiality aspects of the data receiving prime consideration. By way of explanation, it may be useful to outline the general policy followed.

Individual business firms and other organizations submit to the Ontario Statistical Centre, economic, financial and other data regarding their own business operations for the purpose of producing meaningful industrial statistics. In order to ensure a continuous flow of accurate information, the Centre respects an individual's or firm's right to limit the circulation of information about himself or the corporate entity.

Statistical information collected under the Statistics Act, as for example, the Census of Manufactures, are produced by staff members of the Department, who must take an oath of secrecy as prescribed by this Act. Unless written consent has been obtained from the respondent, any information collected under the Statistics Act, or any other confidential data: (a) will be used for internal purposes only; (b) will not be accessible to other government departments or the general public; and (c) will not be used for extracting and publishing information in such manner that it would identify an individual or company.

However, in many instances an individual or firm could be identified indirectly through deduction of plant location, unusual designation or occupational requirements. Therefore, great care is taken to ensure that no specific information shall be published which would identify an individual person or the production activities of an establishment or firm. To avoid residual disclosure, all statistical tabulations for publication are carefully screened in accordance with procedures developed in co-operation with D.B.S., and designed to prevent identification of respondents.

In the Census of Manufactures, for example, an item is considered to be confidential:

- (a) if fewer than three firms report,
- (b) if there are three reporting firms, any one of which accounts for 75 per cent or more, or any two of which account for 90 per cent or more, of the total.
- (c) if there is any number of reporting firms greater than three, where publication of the figures would result in

disclosure. Presumably, this will occur where one firm accounts for 75 per cent or more, or two firms account for 90 per cent or more, of the total reported value of the item.

There has been, during recent years, a growing awareness by economists of the need for extensive regional planning in the economic field, and accordingly, the Province has developed a plan of well-defined economic regions. The complexity of data required for studies within these areas is beyond the data collecting capabilities of individual groups or organizations and requires the combined efforts of private enterprise and all levels of government which will at the same time ensure the proper application of confidentiality procedures.

Participation in statistical projects with the Dominion Bureau of Statistics, municipalities and private enterprise, helps to meet the pressing statistical requirements of the Department of Treasury and Economics, as well as other departments, by providing more current and comprehensive statistics for both the province and smaller geographic areas than otherwise would be available. In summary, Ontario's statistical activity ensures a program interfaced in terms of provincial and sub-provincial data needs.

Census of Forestry

Closely allied with the Census of Manufactures is the Census of Forestry survey recently formalized by the Department of Treasury and Economics and the Department of Lands and Forests in co-operation with the Dominion Bureau of Statistics. The survey will generate data similar in form to that of the Census of Manufactures and cover an important sector of the Ontario economy. Information will be obtained on the organizational structure of the industry, products and services, employment and payroll for approximately 2,000 establishments. These production units are primarily engaged in cutting pulpwood, logs for lumber, cordwood, fuel wood, telegraph and telephone poles.

The information derived from this source will materially assist in supplying a wealth of factual information pertaining to operations in the woods at both provincial and sub-provincial levels. The data will complement inventory studies and other research activities in support of forest management policies developed by the Forestry Department.

The Censuses of Manufactures and Forestry have been mentioned as the type of

selective statistical operation suitable for computer application in developing a Central Information System. Other potential sources of information currently being cultivated will provide new statistical data having relatively high utilization and, accordingly, some reference to these is given below.

Municipal Assessment Survey

The Province of Ontario is currently encouraging all municipalities to adopt a standardized form of collecting, storing, processing, and reporting assessment and related statistical information in such fashion that a fully computerized system will evolve. The Economic and Statistical Services Division, through the Ontario Statistical Centre, is participating with the Department of Municipal Affairs in the design and implementation of this project. As this system becomes operational, the Centre anticipates receiving annually from all assessment jurisdictions in the province, data on population characteristics, land use, and residential and non-residential building inventory.

This basic system was developed by a special committee, organized by the Assessment Branch of the Department of Municipal Affairs with technical assistance provided by the Statistical Centre and the electronic data processing industry. The committee, in the design stages, paid particular attention not only to the needs of assessors and municipal planners, but also considered the long-term requirements of government organizations. Codes, classifications, and standardized forms were designed and built into the framework of this system facilitating optimum computer application. In addition, data processing personnel from larger metropolitan areas, with assistance from the Department of Municipal Affairs and the Centre, developed a standard computer tape layout for use with the new assessment system.

The assessor, who annually visits each property, provides a readily available means for collecting a wide variety of statistics over and above those normally compiled in a decennial census year such as floor and lot area measurements, vehicles per occupancy, and land use data. The statistical information on housing, obtainable from municipal records, is more reliable than information from the decennial census since it is compiled from a total enumeration and dated annually, while information from the decennial census is based upon a sample which, for the cen-

suses of 1951 and 1961, consisted of 20 per cent of all dwellings.

It is anticipated that information from this relatively untapped source of socio-economic data will be incorporated into the Central Information System and, subject to confidentiality restrictions, will become available to various departments for research and planning purposes. There is increasing demand for information of a socio-economic nature on a small area basis for intercensal years. Information from assessment records will help to fulfill this need and, when stored in data bank facilities, this information will be available for studies undertaken, not only by the Department of Treasury and Economics, but also by other government departments such as Municipal Affairs, Highways, Ontario Housing Corporation, Ontario Water Resources Commission and Agriculture and Food.

Upon meeting confidentiality requirements, information from the Municipal Assessment Project will be available for a variety of small area units such as county or district and municipality with its administrative sub-divisions. Such information will assist in the preparation of regional studies in Ontario by providing statistical inputs such as: population and family characteristics, rural area distribution by farm and non-farm units, demographic and other data on urban communities and specified agricultural statistics, including land use. The availability of similar information in a geographic framework is needed by school authorities, city planners, and other researchers. Population data so obtained can be used to modify demographic projections, for planning and other economic studies. Statistical data from this source will provide assistance in developing population series as well as traffic flow projections, extension and routing of proposed new arterial roads, apartment density surveys, and educational studies.

The subsequent acquisition of statistics for any given area will be further enhanced with the development of a geocoding system. When completed, it is anticipated that this system will be used for identifying all assessment data, thus providing permanent land identification in the form of a co-ordinate system based on the smallest possible unit, for example, the property level. Land identified by geocoding is not subject to administrative boundary limitations and may, therefore, be aggregated into any desired area

configuration depending on the unit mesh selected.

Geocoding

The collection, over time, of increasing amounts of data necessary in research and policy planning has made it imperative that the data be standardized and suitably identified. For identification purposes the general procedure currently used is to assign numeric codes to basic area units such as counties and municipalities for reference purposes. Geographic coding procedures are restricted to relatively large units but with the increasing importance attached to small area statistics together with the multiplicity of area configurations required for specific studies, the method has tended to become less satisfactory for many research purposes. With the advances being made in computer technology it is now possible to use a more refined technique by assigning co-ordinates to small units on the basis of a fine spatial mesh. This method known as geocoding assigns co-ordinates with reference to a given point.

The importance of geocoding is brought sharply into focus when consideration is given to the needs of research personnel engaged in a variety of special area studies. Initially, the economic analyst's concept of a small area depends on the type and nature of the study and while an area of specified size and shape is regarded as an adequate economic unit for some surveys, others may require a unit which differs in both size and shape. Thus the interpretation of a small area is flexible and capable of definition only in terms of a particular study or need at a specific time. What is desired is a co-ordinate system which allows the user to more adequately define both the size and the configuration of the area of interest. Geocoding as a means of identification achieves this by not being restricted to the use of discrete geographical sets such as municipalities, counties or regions and as a consequence allows the researcher flexibility to uniquely define a small area and apply relevant data in meaningful terms. The absence of arbitrary boundary conditions, as they currently exist, will ensure that future changes in the size and shape of the geographic units will have no adverse effect on the ability of the economist to both store and retrieve information from the data bank on a continuing basis.

The development of geocoding will therefore, contribute greatly to the establishment of data banks which are capable of providing

information for extremely small units. The records of each of these units stored in the data bank which contain information on taxation, economic and demographic characteristics and other useful series, will be accessible through the use of sophisticated computer programs.

Urban planning bodies will be able to use the information obtained from municipal assessment records and stored in the data bank. In similar fashion those engaged in transportation studies will be able to strengthen the evaluation procedures concerned with public and financial policies. In addition, research in such areas as water resources, public health, education and others will derive benefits from the flexibility in methods of data aggregation brought about through the use of geocoding techniques. Geocoding will fit logically into the Central Information System and will significantly increase the flow of information useful to policy formulation, government research and planning activities.

Mortgage Registration

An agreement has recently been finalized between the Dominion Bureau of Statistics and the Ontario Statistical Centre to conduct a continuing survey of conventional mortgage registrations scheduled to become operational in January of the coming year. This survey will include all conventional mortgages of residential, commercial and industrial properties but will exclude those on leasehold properties as well as all bond and equipment mortgages.

Items of information being considered for the survey questionnaire will include property location, name and address of the mortgagee, coded and classified by eight commercial or industrial activities, as well as the name of the mortgagor, classified by type of borrower. Additional items of statistical value will supply information concerned with the financial

terms of the mortgage such as amount, total price of the property, rate of interest, duration of the contract and purpose of the loan.

Since little or no current information is readily available with respect to conventional mortgage lending on the part of individuals or corporations (other than institutional lenders) this project will serve to bridge a gap in the array of useful economic statistics. Data of this nature will better enable economists concerned primarily with the development of financial flow tables to plan such analyses on the basis of a reliable and continuing information flow.

Supplementary Information Sources

Coincident with the generation of information introduced into a central system as a consequence of comprehensive questionnaire surveys, there exists a continuing need for special data to supplement those already available through the central statistical unit. The Economic and Statistical Services Division obtains this information by the use of special field surveys designed to meet specific needs. The special survey may take the form of a direct questionnaire from the Centre to the respondent, while on some occasions the personal visitation technique, utilizing a field force, may be necessary when the survey is technically involved or otherwise not deemed acceptable in the mailed form. Such surveys may involve universal coverage or selective sampling.

The success of this endeavour will be of direct benefit to both the government sector and the business community. Economic indicators will be more meaningful and sophisticated, while economic models will incorporate many variables for which in the past, data were not available. Provincial and regional accounts, similar to National Accounts data, will be developed to provide accurate and timely information relative to economic activity at these levels.

The Economic and Statistical Services Division recognizes the importance of making available as much publishable economic information as possible. Reports will be released on a regular basis supplemented where feasible by others of a special nature such as econometric studies. Current publications by the Division include the *Ontario Economic Review* which is a bimonthly document and the *Ontario Statistical Review*, produced on an annual basis. The creation of a strong information interface between government and business is a prime objective of the Division's policy. This service, in its ultimate form, will result in better understanding the many facets of the environment in which economic policy is shaped.

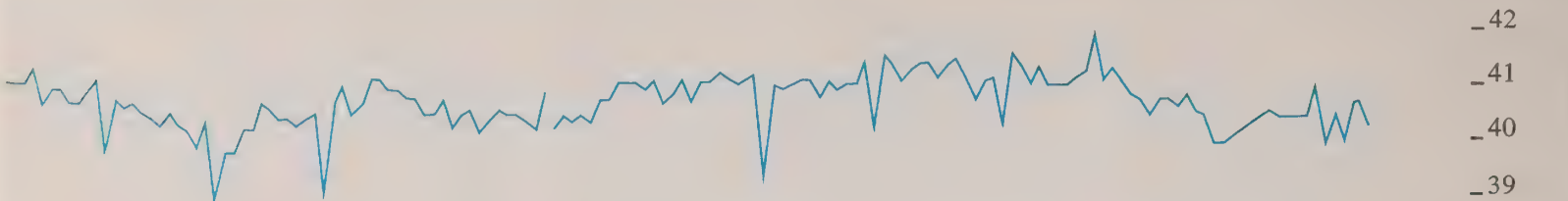
Throughout this article it has been assumed that the rapid change in the present socio-economic environment is likely to accelerate in the future. All the evidence at hand tends to support this assumption. Therefore, continuing review and assessment will be given to methods of collecting, storing and manipulating the data units used in developing sound policies. As the economic structure becomes more complex, new data and more sophisticated techniques must be utilized to support effective policy planning. It is, therefore, intended that a greater integration and flow of economic data be made available through a Central Information System.

The organization of socio-economic data in the Ontario Government will be conditioned by the implicit information required in a wide range of analytical studies and economic models being initiated by research and planning personnel. Another important feature of the system which has been specifically mentioned is the capability of the computer to perform a broad range of processing and computational tasks. Consolidation of these features into the information system is indicative of the structural form it must take in order to attain stated objectives.

Selected Economic Indicators

Leading Indicators

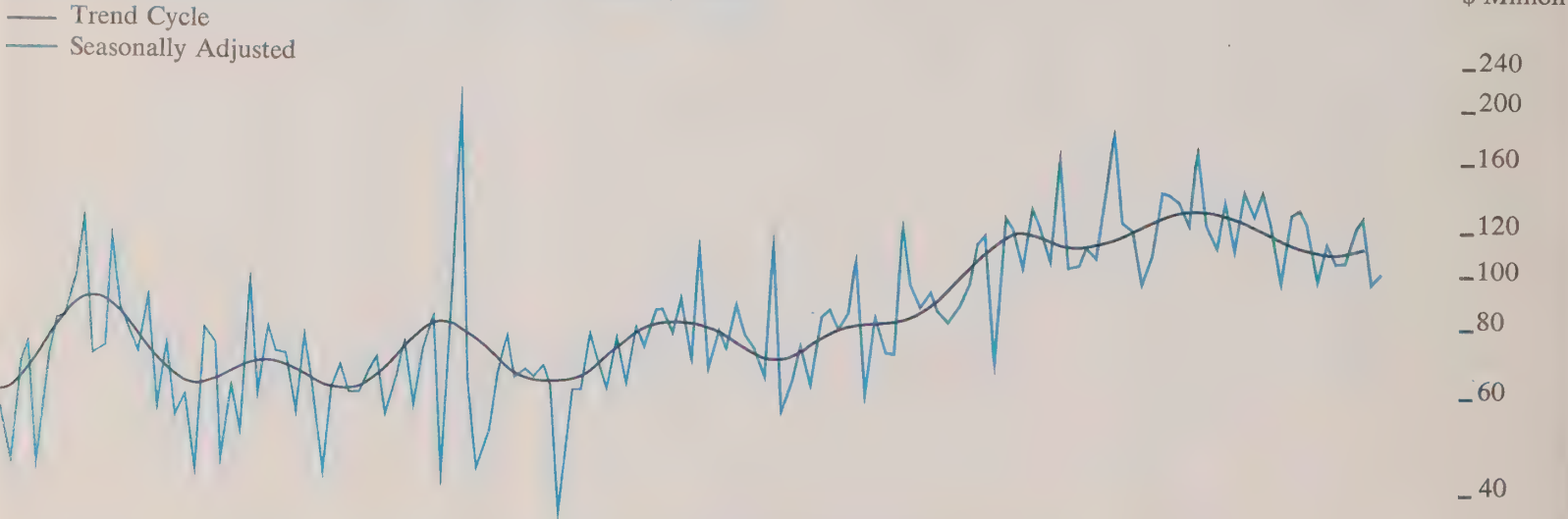
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



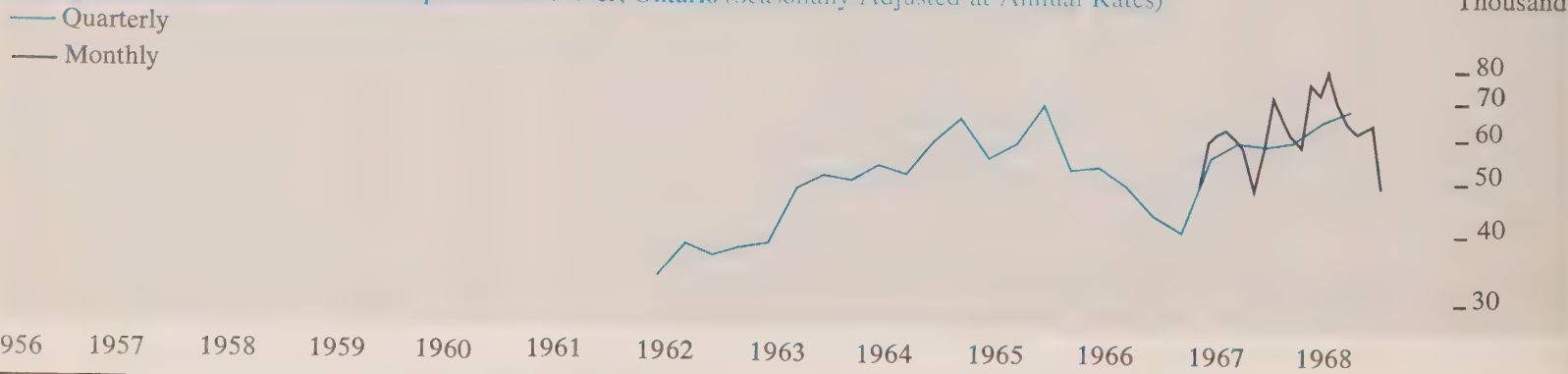
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Business, Industrial and Engineering Construction Contracts, Ontario

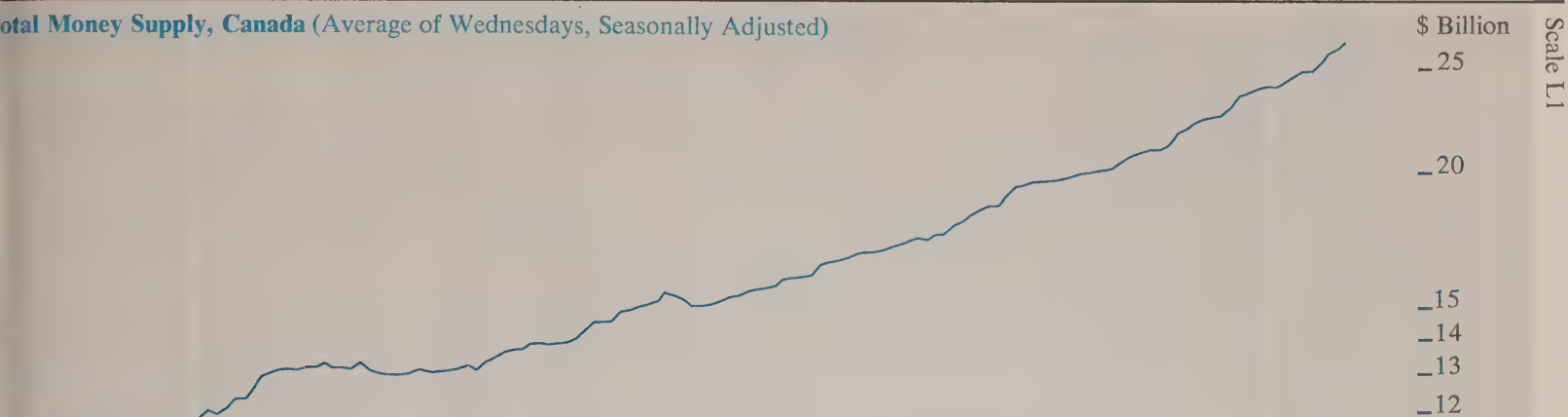


Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

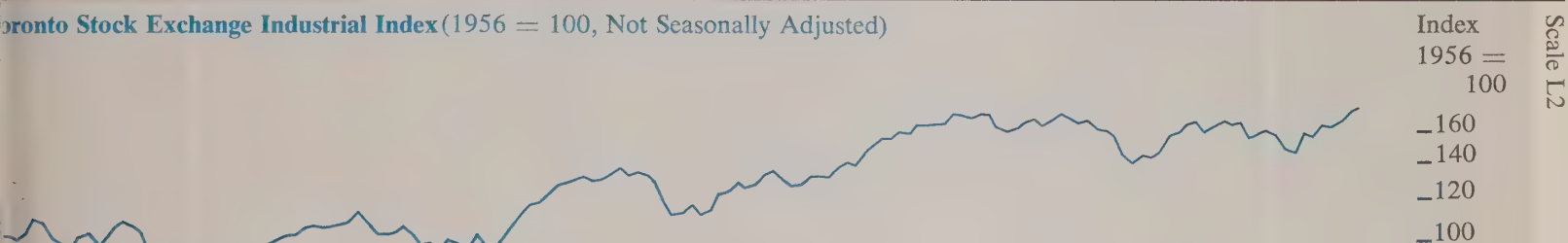


Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

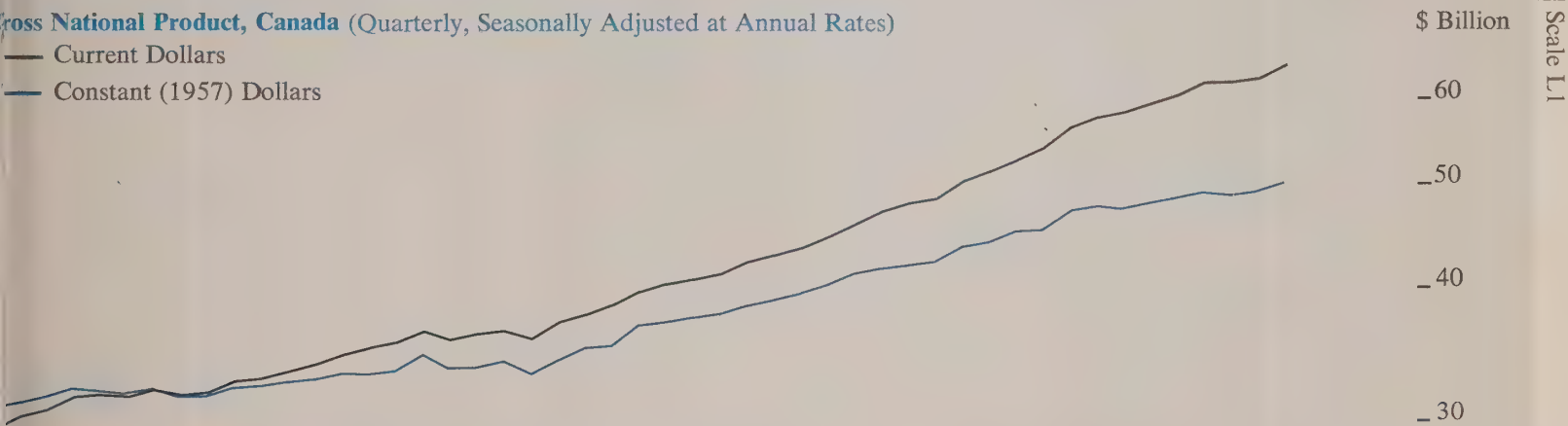


Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)



Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



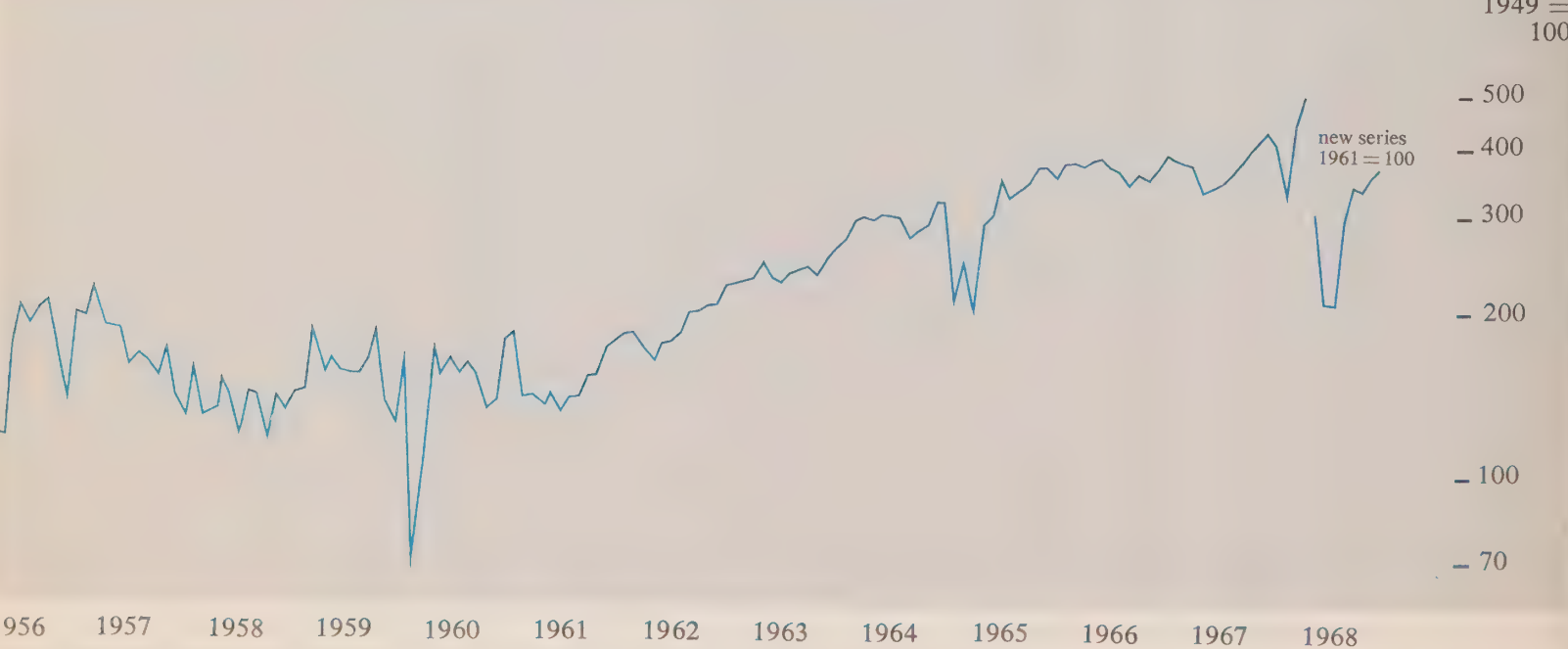
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)



Economic Indicators

Seasonally Adjusted

		1967				1968									
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.
Leading Indicators															
Average Weekly Hours Worked in Manufacturing	Number	40.4	40.4	40.4	40.9	39.9	40.5	39.6	40.6	40.7	40.3	40.3			
New Orders in Manufacturing Industries ^a	\$ Million	3,289	3,300	3,242	3,382	3,225	3,163	3,193	3,280	3,365	3,356	3,385	3,426	3,584	
Business, Industrial and Engineering Construction Contracts	\$ Million	99.2	129.7	133.0	125.4	99.3	114.5	105.1	105.4	122.6	128.7	97.3	101.5		
Urban Housing Starts	Number	72,100	66,100	61,000	58,700	76,600	72,700	79,400	69,200	63,200	60,800	61,900	63,900	48,900	
Money Supply ^a	\$ Million	23,755	23,839	24,041	24,147	24,149	24,479	24,682	24,972	24,987	25,400	25,846	26,314	26,702	
I.S.E. Industrial Index ^a	1956 = 100	168.72	157.39	161.60	162.28	157.43	150.24	146.88	160.43	157.87	166.61	165.93	169.02	176.37	179.61
Business Failures ^a	Number	34	79	43	73	54	59	87	52	50	46	49	28	36	46
Business Failures - Liabilities ^a	\$ Million	2.6	16.6	2.9	24.3	2.6	1.8	5.6	6.4	2.8	6.6	2.9	1.3	1.5	2.1
Coincidental and Lagging Indicators															
Gross National Product ^a (Annual Rate)	\$ Million	62,372			62,992			64,912			66,396				
Average Hourly Earnings in Manufacturing	\$	2.56	2.58	2.58	2.60	2.59	2.58	2.60	2.67	2.68	2.69	2.68			
3-Month Treasury Bill Rate ^a	Per Cent	4.76	4.95	5.46	5.95	6.29	6.80	6.98	6.99	6.95	6.56	6.03	5.48	5.66	
Cheques Cashed in Clearing Centres ¹	\$ Million	5,133	5,081	5,459	5,485	5,006	4,959	5,313	5,031	5,448	5,199	5,381	6,034		
Retail Trade	\$ Million	777	762	773	767	803	768	780	785	779	804	840	835	850	
Labour Force	000's	2,851	2,853	2,860	2,856	2,857	2,892	2,869	2,890	2,918	2,962	2,948	2,937	2,959	3,002
Employed	000's	2,762	2,746	2,764	2,762	2,769	2,793	2,760	2,796	2,796	2,844	2,825	2,837	2,858	2,890
Unemployed	000's	89	107	96	94	88	99	109	94	122	118	123	100	101	112
Unemployed as % of Labour Force	Per Cent	3.1	3.8	3.4	3.3	3.1	3.4	3.8	3.3	4.2	4.0	4.2	3.4	3.4	3.7
Wages and Salaries	\$ Million	1,075	1,070	1,086	1,094	1,109	1,103	1,107	1,130	1,135					
Index of Industrial Employment	1961 = 100	124.6	124.4	125.7	125.8	126.1	124.3	125.2	125.6	125.5	122.3	123.4			
Index of Industrial Production ^a	1961 = 100	152.4	151.1	154.5	156.8	153.8	153.9	154.9	156.8	158.4	160.1	159.5	159.3	161.1	
Total Manufacturing ^a		152.3	149.9	153.9	156.6	153.0	152.2	154.0	156.4	158.1	159.6	157.7	157.9	160.7	
Non-Durables ^a		138.4	137.6	139.3	140.1	138.8	141.9	145.7	143.5	142.8	146.1	142.1	139.8	142.6	
Durables ^a		169.2	165.0	171.8	176.7	170.4	164.8	164.2	172.2	176.8	176.2	177.0	180.0	182.7	
Mining ^a		147.8	149.1	150.8	152.2	145.8	152.8	152.4	153.3	153.1	154.6	156.1	154.2	153.5	
Electric Power and Gas Utilities ^a		160.6	164.0	165.4	165.5	172.9	170.0	166.6	165.7	169.1	172.1	179.9	179.0	176.8	
Primary Energy Demand (Annual Rate)	BKWH	50.98	52.41	53.86	53.78	55.60	55.15	54.01	53.94	53.81	53.83	55.92	55.69	54.83	
Exports (including re-exports) ^a	\$ Million	861.3	956.7	969.4	1,023.0	1,077.7	1,140.4	1,125.7	1,165.3	1,097.2	1,115.9	1,063.5	1,103.5	1,111.5	
Imports ^a	\$ Million	921.8	889.5	882.5	928.7	974.5	1,093.9	970.9	1,026.6	992.2	962.7	927.3	963.0	1,110.9	
Unclassified Indicators															
Foreign Exchange Reserves ^a	U.S. \$ Million	2,221	2,303	2,277	2,268	2,175	2,490	2,244	2,416	2,695	2,574	2,515	2,590	2,534	
Industrial Materials Price Index ^a	1935-39 = 100	251.2	250.1	252.9	254.3	253.5	252.4	253.0	251.2	252.0	253.0	253.4	254.2	253.4	256.8
Consumer Price Index ^a	1949 = 100	150.7	150.5	151.0	151.8	152.6	152.7	153.2	154.1	154.2	154.7	155.6	156.0	156.4	156.8

¹Statistics for Canada.

^aNot seasonally adjusted.

¹Ontario less Toronto.



Ontario Economic Review

Publications

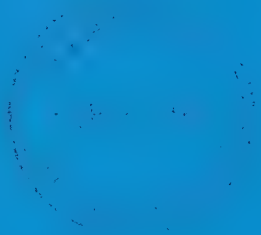
January/February 1969

Volume 7, Number 1 — 6

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister



Ontario Economic Review

January/February 1969

Volume 7, Number 1

The Ontario Economy in 1968

Preliminary Population Projections for Ontario, 1971-1991

R. Kogler, Economist

Economic Analysis Branch

Selected Economic Indicators

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and Economics
Government of Ontario

Hon. Charles S. MacNaughton

Treasurer of Ontario and

Minister of Economics

H. Ian Macdonald

Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 5, Ontario.

About the Review

The feature article for the January-February edition of the *Ontario Economic Review* presents long-term population estimates for the Province of Ontario. The projections, by five-year age groups and for five-year intervals, are based primarily on 1966 census data and reflect current demographic trends.

At present, fertility rates are decreasing and death rates continue to decline while net migration adds an average population increment of approximately 50,000 per year in Ontario.

However, it should be emphasized that these projections represent extensions of current demographic trends and thus reflect the anticipated outcome of changes in the population structure. Therefore, to the extent that social attitudes and economic conditions are subject to change, these projections should be considered preliminary.

This article, an extract from a more detailed study, was prepared by Mr. R. Kogler, Economist with the Economic Analysis Branch, Economic and Statistical Services Division, Department of Treasury and Economics. The author acknowledges with appreciation the contribution of Dr. J. Samuel, formerly with the Economic Analysis Branch, to the research and preparation of this study.

The material for the review of the Ontario Economy in 1968 was largely prepared by the Economic Planning Branch of the Policy Planning Division, Department of Treasury and Economics.

Indicator Charts, Pages 10-12

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 10-12 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

The tempo of economic activity picked up sharply in 1968 after passing through a period of slow growth the year before. The resulting gains in the economy exceeded even the most optimistic predictions of one year ago. Gross provincial product — the total value of final goods and services produced in Ontario — rose to an estimated \$26.9 billion, up 8.0 per cent from the \$24.9 billion recorded in 1967. Unlike the previous year, moreover, 1968 saw real growth (4.5 per cent) exceed the growth of prices (3.5 per cent).

This more rapid pace in the economy has been reflected in rising income, production, investment and employment. At a more visible level, it has shown itself in rising housing construction, increased purchases of automobiles and a general increase in the purchases of a wide variety of consumer goods.

What has made these advances all the more remarkable is the number of adverse factors which at times confronted the economy in 1968. From the very beginning of the year there were pressures which ordinarily might have seriously impaired the province's economic growth. Early in the year the United States announced a number of measures designed to improve its balance of payments position. Among these was one which appeared to threaten Canada's economic health: the restriction of investment in U.S. subsidiaries. Speculation that this would lead to massive repatriation of U.S. funds produced fears for the Canadian economy which did in fact result in abnormally large sales of Canadian dollars. This finally subsided when the U.S. provided assurances that funds would not have to leave Canada, and was later reinforced by the exemption of Canada from U.S. guidelines on direct investment and lending by U.S. banks.

This was barely over when the international monetary crisis of March developed over speculation about the future role of

gold. This was eased with the recommendation and acceptance of the two-price gold system. Under this arrangement, central banks will buy and sell gold at the official price of \$35 (U.S.) an ounce, while the price on the open market would be free to fluctuate. The system appeared to function effectively during the second and third quarters of the year but new monetary unrest in the latter months revealed that it was only partially effective in facilitating stability and may be considered more of a stopgap measure than a final solution to international monetary problems.

Responding to a decided easing in U.S. monetary policy and credit conditions and faced with the problem of replenishing government cash balances — which were being rapidly depleted by the rebuilding of exchange reserves lost in January, the redemption of Canada Savings Bonds and higher than projected government outlays — the Bank of Canada embarked on a policy of monetary ease. Successive reductions in the bank rate to its pre-crisis level were accompanied by a 14 per cent expansion in the public money supply over a seven-month period. Banks were provided with sufficient reserves to accommodate a moderate rise in loan demand as well as to add over \$1.0 billion to their treasury bill and government bond holdings. Money market rates went below 5.5 per cent, and yields on long-term government bonds dipped below 6.5 per cent.

The final quarter of 1968 saw a new crisis on the international monetary scene involving the major European currencies. However, the Canadian dollar remained strong. The lack of response of the buoyant U.S. economy to fiscal restraint prompted the Federal Reserve System to shift to a less permissive stance and to reinforce this move on December 17th by raising the discount rate from 5.25 per cent to 5.5 per cent. The Bank of Canada followed almost immediately with an increase in the bank rate from 6.0 per cent to 6.5 per cent. Intense pessimism, especially

in connection with widespread inflationary expectations, engulfed bond markets during November and December, and bond yields rose well above their earlier peaks while short-term rates advanced moderately.

Ontario was also hard hit by strikes in 1968, especially in the first half of the year. Industrial disputes — particularly in the automobile industry, which is virtually all located in this province — seriously restrained production early in the year. As a result more man-days of work were lost in less than six months than had been lost throughout all of 1967. As the leading industrial province, Ontario has carried a substantial proportion of the total Canadian burden in 1968. Out of a total loss of 4.6 million man-days, Ontario has accounted for 60 per cent or 2.8 million man-days during the first nine months of 1968.

Despite these adverse factors, any one of which would have been considered harmful to the economy, Ontario scored impressively in 1968. Undoubtedly the largest single contributing factor was the outstanding 15.0 per cent rise in provincial exports. At the national level the total value of exports increased by 19.0 per cent — more than twice the growth target set by the federal government and the biggest annual percentage increase in 17 years.

Export growth was concentrated in the United States which took more than 67.0 per cent of total Canadian shipments abroad. Sales to the U.S. expanded in value by a remarkable 25.4 per cent to \$9,183 million, however, sales to all other countries increased by less than 7.5 per cent to \$4,393 million. For the fourth consecutive year since the inception of the Canada-U.S. Auto Agreement Canada's total automotive exports were impressively strong rising approximately 52.0 per cent over 1967, as American consumers increased their spending reflecting higher incomes. By year-end the annual value of auto exports was approximately \$1,363.9 million — almost 10 times what it was in 1965, the first year of the agreement. In addition, since the auto trade agreement was signed in 1965, about 50,000 new jobs have been established in Canada and about \$600 million invested in new plant and equipment. Added to this generally buoyant environment was the stimulus of strike-induced purchases from Canada. In an attempt to protect against an anticipated steel strike — which never materialized — Ameri-

New Motor Vehicle Sales: Ontario

	1967	1968 ¹	1968/67
	Units Sold		Per Cent Change
Passenger	274,976	304,673	10.8
Commercial	44,863	50,515	12.6
Total	319,839	355,021	11.0

¹ Estimate, Department of Treasury and Economics.

Source: DBS, New Motor Vehicle Sales.

Canadian Domestic Exports, 1965-1968

	1965	1966	1967	1968	66/65	67/66	68/67
	\$ Million				Per Cent Change		
Commodity Group:							
Food, feed, beverages and tobacco	1,629.8	1,888.5	1,602.1	1,530.0 ¹	15.9	—15.1	—4.5
Inedible crude materials	1,763.7	1,947.3	2,108.3	2,483.5 ¹	10.4	8.2	17.8
Inedible fabricated materials	3,728.8	4,012.2	4,229.1	4,854.9 ¹	7.6	5.4	14.8
Inedible end products	1,300.1	2,119.3	3,106.8	4,240.7 ¹	63.0	46.6	36.5
Geographic Group:							
United States	4,840.5	6,234.9	7,323.2	9,183.2	24.5	17.4	25.4
United Kingdom	1,174.3	1,131.8	1,178.1	1,224.1	—4.4	4.1	3.9
All Others	2,510.3	2,959.1	2,909.7	3,169.2	16.3	—2.0	8.9
Total	8,525.1	10,325.9	11,410.9	13,576.4	18.1	10.3	19.0

¹estimate. Department of Treasury and Economics.

Source: DBS, Summary of Exports.

Total Motor Vehicle and Parts Exports

	1967	1968	1968/67
	\$ Million		Per Cent Change
Passenger automobiles and chassis	879.4	1,363.9	55.1
Other motor vehicles	326.7	458.7	40.4
Motor vehicle engines and parts	158.9	251.1	58.1
Motor vehicle parts, except engines	365.1	566.5	55.1
Total	1,730.1	2,640.2	52.6

Source: DBS, Summary of Exports.

cans sharply increased imports of iron and steel products as well as a number of other important metals. The result for Canada was a remarkable advance in its exports of metals to the United States, one which helped push total Canadian exports to all countries to \$13.6 billion.

Although exports dominated the advances made in 1968, and played an important role in pulling the entire nation out of the 1967 slowdown, there were other noteworthy improvements as well. Ontario's housing construction rose sharply for the second successive year. The injection of additional funds into housing and some easing in the money markets contributed to the estimated record 80,375 housing starts, a gain of approximately 18.0 per cent.

Personal consumption, reflected in retail sales, also moved up sharply in 1968. Total retail sales rose to \$9.7 billion in Ontario for the first eleven months, up approximately 9.0 per cent from 1967's \$8.9 billion. The largest advances, ranging between eight and twelve

per cent, took place in motor vehicles, garages and filling stations, department, general and grocery stores.

Rising sales were a reflection of yet another prominent advance, that of personal income. While the gain in wages and salaries eased slightly from the exceedingly high growth rate of 1967, it was nevertheless quite substantial. Improved profits — reflecting higher productivity gains — added to this and helped push total Ontario personal income to \$20.5 billion, a gain of approximately nine per cent.

Of course the gains in the economy were not all impressive. While labour force and employment both rose from their 1967 levels, labour force rose more rapidly, widening the gap between them and increasing the rate of unemployment. The labour force reached 2,935,000 on an annual basis in 1968, while employment rose to 2,830,000. The resulting 3.6 per cent unemployment rate represented an increase from the 3.2 per cent rate of the preceding year, but still compared quite

favourably with the 1968 Canadian rate of 4.9 per cent.

There were other instances of moderate gains. Non-residential construction, unlike housing, moved ahead only moderately with most of the activity centred in commercial, institutional and government construction. Investment in machinery and equipment to was somewhat restrained. According to the mid-1968 survey of investment intentions, a gain of only 1.8 per cent was to have been anticipated for all of 1968. This same survey outlined a total gain of 7.0 per cent for a private and public investment, taking it from \$5.3 billion in 1967 to \$5.6 billion in 1968. Most of this gain is attributable to the 17.0 per cent rise in housing investment.

On the whole, there has been a moderate improvement in the price situation although there was some deterioration toward the end of the year. The near four per cent price increase of 1967 should ease marginally to approximately 3.5 per cent in 1968 (according to implicit price indexes of gross national expenditure) as the pressures for higher wages and salaries abated very slightly.

For the third successive year price increases were fairly large, accounting for a major portion of the rise in gross national and gross provincial products. Following a pattern very close to that of 1967 price increases were largely the result of excessive demand with increased prices mainly due to rising costs, in particular rising wages. Once again the largest increases came in the housing, government expenditure and service sectors with gains ranging roughly between

The Consumer Price Index, Canada, Ottawa and Toronto, December 1968/December 1967¹

	All Items	Food	Housing	Clothing	Transportation	Health and Personal Care	Recreation and Reading	Tobacco and Alcohol
Canada								
1968	158.0	154.4	161.2	138.8	162.7	201.0	180.1	141.1
1967	151.8	148.6	153.8	134.7	159.6	193.8	169.7	133.0
% Change	4.1	3.9	4.8	3.0	1.9	3.7	6.1	6.1
Ottawa								
1968	156.5	154.8	151.9	144.7	178.0	211.9	176.5	152.2
1967	150.1	150.4	144.9	140.2	169.8	206.1	165.4	139.8
% Change	4.3	2.9	4.8	3.2	4.8	2.8	6.7	8.9
Toronto								
1968	159.4	152.1	161.9	146.9	160.8	196.2	221.8	149.1
1967	153.3	146.4	154.8	142.3	160.0	191.3	210.9	136.0
% Change	4.0	3.9	4.6	3.2	0.5	2.6	5.2	9.6

Source: DBS, Price Movements.

four and seven per cent. One major exception from last year was food prices which increased very slightly in 1967 but moved up more than three per cent in 1968. In other areas prices increased at approximately the same rate as the preceding year with the small increase in export prices once again helpful in Canada's struggle to remain competitive in world markets.

Looking at the consumer price index, the other important measure of price increases in the economy, the overall increase for all items was 4.1 per cent from December 1967 to December 1968. Gains here also showed a tendency to be concentrated in services while food prices showed a more than average expected increase of 3.9 per cent. Housing prices also experienced a sharp increase last year.

On a regional basis, the two Ontario centres covered by the survey — Toronto and Ottawa — experienced price increases equal to and greater than the national average. In Toronto, the December 1968 level of 159.4 was 4.0 per cent above the corresponding level twelve months earlier. The Ottawa level of 156.5 was 4.3 per cent higher than one year ago. Relative to nationwide increases, food, housing and clothing prices rose approximately the same amount in the two Ontario centres. While transportation costs in Toronto increased by 0.5 per cent, the corresponding index for Ottawa rose 4.8 per cent. Ottawa surpassed Canada in the recreation and reading component as well as registering — along with Toronto — significantly

larger than national gains in the tobacco and alcohol category last year.

Looking to the future, the most important unknown factor to reckon with is the rate of economic growth in the United States. If, as expected, the U.S. economy cools off noticeably in the first half of the year (as a result of the tax increases and spending cuts imposed last July), Canada will inevitably feel some of the dampening effects. Exports certainly will not enjoy the same rate of growth as in 1968, but much of this is due to the special circumstances which existed last year. Hopefully they will reach the anticipated level of average gain of ten per cent, although the extent of cooling in the United States will determine whether this goal is reached. Furthermore, if this cooling persists for any length of time, it could affect the growth of Ontario's manufacturing.

These cautionary words may yet prove unnecessary. The U.S. economy has continued to display great strength much to the surprise of those who have been predicting downturns since late last summer. In the light of the mounting exemptions to U.S. government spending cuts, which has the effect of easing any dampening in the economy, it would appear likely that the cooling will take place but will not be severe enough to cause considerable disruption. In any event any cooling that might take place to ease the serious inflationary conditions in the U.S. may give way to higher growth rates at mid-1969. This is conditional on whether or

not the Revenue and Expenditure Control Act of 1968, which is responsible for the cooling, will be allowed to automatically expire at that time.

Even with a considerable lessening in U.S. demand, the Canadian and Ontario economies are in sufficiently strong positions to withstand any adverse effects in the first half of the year. Unlike the United States, Canada and Ontario will not experience any substantial inventory liquidation, mainly because this adjustment had been made late in 1967. The year 1969 should also see a repeat of the good gains made in housing construction along with some improvement in investment in machinery and equipment.

In manufacturing it is expected that further improvements in productivity will be recorded in the year ahead with only mild disturbances in the first half if the U.S. economy decelerates to any substantial degree. Consumer spending should continue fairly strongly as incomes once again rise substantially, although there is some question as to the extent that retail sales will be affected by the recent income tax increases.

In general Ontario can look forward to a year of growth similar to that of 1968. Gross Provincial Product is expected to rise to \$28.9 billion, a gain of approximately 7.4 per cent, made up of a less inflationary price increase of 3.2 per cent and real growth of roughly 4.2 per cent. This broadly based strength in the economy should therefore produce another year of prosperity for Ontario.

Preliminary Population Projections for Ontario, 1971-1991

R. Kogler, Economist
Economic Analysis Branch

Population and estimates of future population provide a basis for the formulation of both public and private policy. Information is therefore essential not only on the present size and composition but also on the anticipated size, growth rate, age and sex distribution of the provincial population in order to facilitate economic and social planning.

An accurate estimate of anticipated labour supply is required by the government to ensure the provision of adequate employment opportunities in the future and to assure optimum utilization of available natural resources. Information on the projected size, composition and distribution of the population is necessary to estimate the future demand for educational institutions, transportation and recreation facilities, medical and health services, water supply, sewage disposal and housing. Estimates of the availability and location of labour supply are essential to the private business sector in formulating long-term expansion programs. In addition, the future level of demand for goods and services is dependent upon the anticipated size and composition of the population in conjunction with purchasing power.

Historical Trends

Since the turn of the century Ontario's population has registered nearly a three-fold increase. The average annual rate of increase of 1.5 per cent during the period 1901-1931 fell to 1.0 per cent in the thirties, but rose to 2.0 per cent in 1941-51 and to over 3.0 per cent in 1951-61 before falling to 2.2 per cent in 1961-66. In comparison to the national average for Canada, the rate of growth of population in Ontario remained below that figure in the first quarter of this century, surpassed the national average in the second quarter and has continued to exceed the national average in the third quarter.

Scrutiny of the components of population growth in Ontario shows that roughly two-thirds of that growth may be traced to natural increase (the net balance of births over deaths) and one-third to net migration (immigration minus emigration).

Projections in the Past

Population projections for Ontario have been prepared previously in 1957¹ and in 1963². The 1963 projection was based on the 1961 census and covered a period of 25 years to 1986. Both reports contained projections for the ten economic regions, counties and principal urban centres of Ontario. In addition

to population projections, the 1963 report included estimates of anticipated labour force. The "component method" was used in the preparation of both these projections.

Let us briefly consider the previous projections made for Ontario in the light of actual population data now available. The 1957 projection forecast 6,249,000 and 6,990,000 people as the likely population of Ontario for 1961 and 1966 respectively. The actual figures for these years were reported as 6,236,000 and 6,961,000. The 1963 projection arrived at a figure of 6,854,000 for 1966 on the assumption of 12,000 annual net migration per annum and a figure of 6,974,000 on the assumption of 36,000 net migration per annum.

The closeness of the projected and actual figures of population should be seen in the light of two factors: First, the comparison between the projected and actual population figures has been only for a relatively short period of time. Second, the components of population growth such as natural increase and migration might move in directions other than anticipated and such movements could cancel errors which would otherwise have appeared. Such a phenomenon did occur in the period 1961-66 when natural increase turned out to be less than expected but this deficiency was compensated for by a greater than anticipated migration, resulting in a total figure very close to the projection.

Assumptions

As with any forecast, population projections must be considered in the light of the assumptions on which they are based. Some of these assumptions are of a general nature regarding the economic, political and social conditions likely to prevail in the area during the period for which the projections are made. Usually, all population projections assume that no major wars, catastrophes or serious economic depressions will occur during the period. Excepting minor business cycles, an uninterrupted high level of economic activity is assumed throughout the period of the projection. In addition, assumptions of a more specific nature pertaining to the future behaviour of the demographic variables of fertility, mortality and migration are made.

Fertility

Fertility, the most important demographic variable in the context of population projections, is also the most difficult when making assumptions. As observed by the United

States Bureau of the Census: "of the components of population change, the fertility component is the one with the highest degree of uncertainty in determining the population for future years."³ This becomes clear even by a cursory examination of the fertility variable in the past.

The crude birth rate⁴ for Ontario for the period 1921-25 stood at 23.7, from there it fell to 17.5 in 1936-40, then rose to 26.8 in 1957 before falling again to 17.8 in 1967. "Total fertility rate"⁵ rose from 2,648 in 1931 to 3,714 in 1957 and then declined to 2,787 in 1966. This decline in fertility during the last decade occurred in spite of a lowering in the average age at first marriage of women from 23.7 in 1951 to 22.5 in 1965. The percentage of married women in the age group 20-24 and 25-34, the crucial age groups for fertility, rose to 65.3 per cent and 88.5 per cent respectively in the 1960's as compared to 57.2 and 83.9 in 1951. Furthermore, between 1961 and 1966 the number of first marriages for females increased by 23.6 per cent.

However, all these factors have not been instrumental in raising the level of the crude birth rate as expected. Instead, the crude birth rate, as was the case with the age-specific fertility rate,⁶ has further declined. The decline in both the crude birth rate and age specific fertility rate in the light of the information on the rate of and age at marriage makes abundantly clear that the cause of the fertility decline could not be traced to a change in marriage rates or age at marriage. Fertility is being controlled within the institution of marriage. Moreover, it is anticipated that the social, economic and psychological pressures that motivate married couples to limit their families are likely to continue unabated for some time.

A further decline in fertility cannot be ruled out in view of the increasing number of years spent by young women in educational institutions, increasing urbanization, greater work experience and higher female labour force participation rates. Moreover when the high and increasing cost of bearing and rearing children may be avoided by the effectiveness of oral contraception and the anticipated introduction of more liberal abortion laws, additional family limitation may be expected. The gap between the rising level of expectations resulting from the influence of the communications media and the realization of these expectations (in an economy where suitable jobs for many young

¹Province of Ontario, Department of Economics, Population Projections For the Economic Regions, Counties and Urban Areas of Ontario, 1963.

²Government of Ontario, Department of Economics and Development, Population and Labour Force Projections For Economic Regions of Ontario, 1961-1986.

³U.S. Bureau of the Census, Projections of the Population of the United States by age, sex and color to 1990 with extensions of population by age and sex to 2015, *Population Estimates*, p. 18.

persons entering the labour force in the next few years may be in short supply), may also motivate young couples to postpone family formation or to restrict its size. Therefore in the light of the recent decline in fertility three assumptions are made regarding the probable course of fertility trends. All of them assume a further decline in fertility, but at different rates:

(A) Age-specific fertility rates, except for the age group 15-19, will remain at 1966 levels till 1971 and then will decline till 1991 at rates ranging between one and three per cent per annum for the different age groups. A decline in age-specific fertility rate for the 15-19 age group is believed to have commenced in 1967. The corresponding decline in total fertility rate will be from 2,787 in 1966 to 1,397 in 1991, a decline of 49.9 per cent.

(B) Age-specific fertility rates for various age groups will decline by three to five per cent per annum till 1971 and then will remain constant for the next 20 years. In terms of total fertility rate, the decline will be from 2,787 in 1966 to 2,156 in 1971 where it will remain stable till 1991, a decline of 22.6 per cent.

(C) Age-specific fertility rates for all age groups will fall by three per cent in 1967 and thereafter will remain unchanged. The total fertility rate would be stabilized in 1967 at the level of 2,704.

Mortality

Mortality rates in Ontario have registered significant declines in the twentieth century. This has been particularly evident for the 0-4 age group whose mortality rate dropped from 24.8 in 1921-25 to 5.1 in 1961-66. The mortality rate for the 5-14 age group in 1961-66 was 20 per cent less than in 1921-25. During the same period the mortality rate for the 15-39 age group was reduced by one-third. The decline in the mortality rate for older age groups has also been significant, though not as great as the reduction for the younger age groups.

The main causes of death in the higher age groups are diseases of the circulatory systems, malignant neoplasms, diseases of the nervous system and accidents. However, despite recent medical advances such as successful transplants of vital organs the mortality rate for those in this age group is unlikely to register any significant decline in the near future.

Since mortality rates have shown a definite downward trend in the past, it is less difficult to make plausible assumptions on the expected behaviour of mortality than on fertility. On the basis of the historical over-all trends, the expected decline in mortality rates during the period 1966-1991 for various age groups can be classified as follows:

(a) Age groups 0-1, 1-2 and 2-3: 25-34 per cent

(b) Age groups 3-4, 35-39 and 40-44: 15-24 per cent

(c) Age groups 25-29, 30-34, 45-49, 50-54, 55-59, 60-64, 80-85 and 85 plus: 5-14 per cent.

(d) Age groups 5-9, 10-14, 15-19, 20-24, 65-69, 70-74 and 75-79: 0-4 per cent.

Migration

Migration, international as well as internal, has been a significant factor influencing Ontario's population growth. Migration accounted for 43 per cent of the population increase in Ontario during the period 1961-65. Since 1949 over 50 per cent of all immigrants arriving in Canada gave Ontario as their province of destination.

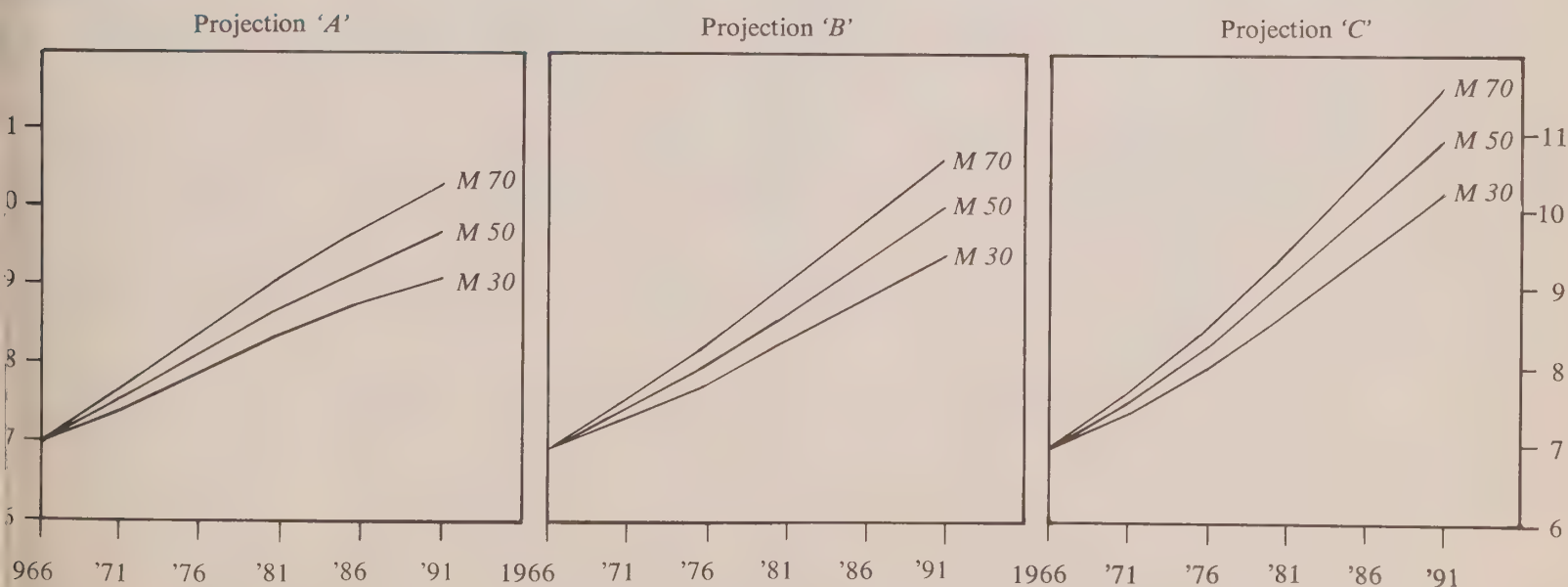
Inter-provincial migration estimates are much more difficult to obtain since no record is made of provincial border crossings. However during the intercensal years between 1951 and 1961, net internal migration to Ontario from other provinces has been estimated at over 12,000 per annum.

During the intercensal period of 1961 to 1966 average annual net migration, including both international and internal migration to Ontario has been 48,000 as compared to an annual average of over 62,000 for the intercensal period 1956-61.

In order to make assumptions regarding the future level of international migration, one has to take into account the joint impact of the forces of "push" on the immigrant from

Ontario Population Levels, 1971 - 1991

Millions



Crude birth rate — number of births per thousand of total population.

⁵Total fertility rate — number of births which 1,000 women would have throughout their lifetime, assuming no mortality, if they experienced at each age the fertility in effect during the period concerned.

⁶Age-specific fertility rate — number of births occurring in a specific age-group per 1,000 women in that age-group.

the home country and of "pull" from the host country. These forces are dependent upon the economic, social and political conditions existing in Ontario and Canada as well as in the countries from which immigrants are drawn. Needless to say, it would be difficult to forecast the types of changes expected in the countries concerned.

Policies, programs and administrative procedures adopted or likely to be adopted by the Canadian government, the governments of the countries from which the immigrants originate or third countries to which they might go, also influence the rate of net immigration. The tightening of U.S. immigration regulations in particular is expected to slow down the emigration of Canadians to the U.S.A., and thus will raise the level of net migration to Canada and Ontario.

Interprovincial migration depends, primarily, upon the performance of Ontario's economy in comparison with the economies of other provinces, the age distribution of the population (90% of the net immigration to Ontario from other provinces in the past has been in the age group 5-29) and the efficiency and cost of communication and transportation facilities. All these considerations make migration a difficult variable to forecast. Nevertheless, on the basis of historical figures on net migration and in view of the prevailing economic, political and social conditions in Ontario, Canada and elsewhere, three assumptions may be made regarding the likely annual increments to Ontario's population through net migration.

(a) The annual net migration will be 30,000 (*M 30*).

(b) The annual net migration will be 50,000 (*M 50*).

(c) The annual net migration will be 70,000 (*M 70*).

The three assumptions each on fertility and migration, along with the single assumption on mortality yield nine sets of projections in all. The assumptions on fertility and migration pertaining to each set of projections may now be reviewed in combination:

1. '*A*' - *M 30*. Total fertility rate will decline from 2,787 in 1966 to 1,397 in 1991 and the annual rate of net migration will be 30,000.

2. '*A*' - *M 50*. Total fertility rate will decline from 2,787 in 1966 to 1,397 in 1991 and the annual rate of net migration will be 50,000.

3. '*A*' - *M 70*. Total fertility rate will decline from 2,787 in 1966 to 1,397 in 1991

and the annual rate of net migration will be 70,000.

4. '*B*' - *M 30*. Total fertility rate will decline from 2,787 in 1966 to 2,156 in 1971 where it will remain stable till 1991 and the annual rate of net migration will be 30,000.

5. '*B*' - *M 50*. Total fertility rate will decline from 2,787 in 1966 to 2,156 in 1971 where it will remain stable till 1991 and the annual rate of net migration will be 50,000.

6. '*B*' - *M 70*. Total fertility rate will decline from 2,787 in 1966 to 2,156 in 1971 where it will remain stable till 1991 and the annual rate of net migration will be 70,000.

7. '*C*' - *M 30*. Total fertility rate will remain unchanged at the 1967 rate of 2,704 and the annual rate of net migration will be 30,000.

8. '*C*' - *M 50*. Total fertility rate will remain unchanged at the 1967 rate of 2,704 and the annual rate of net migration will be 50,000.

9. '*C*' - *M 70*. Total fertility rate will remain unchanged at the 1967 rate of 2,704 and the annual rate of net migration will be 70,000.

Detailed estimates of population by five-year age groups to 1991 are presented in the Appendix. The projections shown here are based on migration assumptions of 50,000

Population Distribution by Specific Age Groups, Ontario 1966

Groups	Number	Per Cent
0-14	2,204,075	31.7
15-64	4,189,073	60.2
65+	567,722	8.1
	<u>6,960,870</u>	<u>100.0</u>

per annum (the medium assumption) and 70,000 per annum (the most optimistic assumption).

Methodology

The "component method" has been used in the preparation of these projections. This method treats each component of population change such as fertility, mortality and migration separately and the resulting population figures are then aggregated.

The method has been used in four stages. Stage one consists of selecting a benchmark or base population year. Since the 1966 census provides detailed data on Ontario's population by sex and age, 1966 has been used as the benchmark year.

Next, projected survival rates by age groups and sex are applied to the base year population for successive years and the surviving

Projected Population Distribution by Specific Age Groups, Ontario 1991

Age Groups	'A' - M 30		'A' - M 50		'A' - M 70	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
0-14	1,854,500	20.3	1,993,000	20.5	2,131,300	20.6
15-64	6,286,700	68.8	6,724,100	69.0	7,162,200	69.3
65+	1,001,100	11.0	1,023,600	10.5	1,045,700	10.1
Total	<u>9,142,300</u>	<u>100.0</u>	<u>9,740,700</u>	<u>100.0</u>	<u>10,339,200</u>	<u>100.0</u>

Age Groups	'B' - M 30		'B' - M 50		'B' - M 70	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
0-14	2,293,800	24.1	2,457,600	24.2	2,621,200	24.3
15-64	6,229,600	65.4	6,666,100	65.7	7,102,500	66.0
65+	1,001,100	10.5	1,023,300	10.1	1,045,800	9.7
Total	<u>9,524,500</u>	<u>100.0</u>	<u>10,147,000</u>	<u>100.0</u>	<u>10,769,500</u>	<u>100.0</u>

Age Groups	'C' - M 30		'C' - M 50		'C' - M 70	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
0-14	2,878,500	27.9	3,073,600	28.0	3,268,800	28.1
15-64	6,427,300	62.4	6,869,600	62.6	7,311,800	62.9
65+	1,001,100	9.7	1,023,400	9.3	1,045,700	9.0
Total	<u>10,306,900</u>	<u>100.0</u>	<u>10,966,600</u>	<u>100.0</u>	<u>11,626,300</u>	<u>100.0</u>

Percentage Increase of Women in 20 - 24 Age Group for Specified Years

	1971	1976	1981	1986	1991
1. Most optimistic ('C' — M 70)	31.1	52.7	74.5	74.4	64.1
2. Medium ('B' — M 50)	28.0	48.8	68.4	66.6	43.9
3. Most pessimistic ('A' — M 30)	24.9	44.1	62.3	58.7	38.8

Base year, 1966.

population at the end of the required period is summed up into the appropriate age groups.

At the third stage, the fertility factor is introduced. Projected age-specific fertility rates are applied to the appropriate age groups to obtain the number of births in each year which are then subjected to specific survival rates.

Finally, the migration element is introduced. Fertility and survival rates are applied to the net migration figure and the net migration as well as natural increase from migration is added to the population by age groups.

Implications of Age Distribution

The age distribution of the population, which is of immediate importance to various agencies using population forecasts, would vary according to the set of assumptions used.

If we assume that the medium assumption ('B' — M 50) is the most plausible, the age group 0-14 which consists mostly of school-age population will fall to 24.2 per cent of the total population in 1991 as compared to 31.7 per cent in 1966. The 65-plus age group would consist of 10.1 per cent of the 1991 population as compared to 8.1 per cent in

1966. The dependants in the population will decrease from the 1966 percentage of 39.8 to 34.3 in 1991. The population in the working age group 15-64 will increase from 60.2 per cent to 65.7 per cent. The implications of using the various assumptions on age distribution can be seen from the tabulations on page 6.

By 1991 the 0-14 age group will have increased by only 11.5 per cent from the 1966 level, while the 65-plus age group will show an increase of 80.3 per cent if the medium assumption is used. The 15-64 age group in 1991 will have increased by 59.1 per cent over 1966.

If the combination of most "optimistic" assumptions is used ('C' — M 70) the 0-14 age group will rise by 32.6 per cent in the 25-year period 1966-1991, the 15-64 age group by 74.5 per cent and the 65-plus age group by 84.2 per cent. On the other hand if the most "pessimistic" combination of assumptions is used ('A' — M 30) the 0-14 age group will decrease by 15.9 per cent, the 15-64 age group will increase by 50.7 per cent and the 65-plus age group by 76.3 per cent during the same period.

Since the median age at marriage for women in Ontario during the period 1960-65 was 21, the age group 20-24 would be of special interest for studying the implications of family formation on the economy. This age group will strongly influence the demand for living accommodation, the expenditure on household appliances and other durable goods. The accompanying table shows the expected increase over 1966 during the period 1971-1991 under various assumptions. The peak level of population in this age group under all the assumptions above will be reached in 1981.

Limitations

The value of population projections is in the guidelines they provide for both the formulation of government policy and the private decision-making process. Because of the assumptions on which they are based the accuracy of the estimates is necessarily approximate. The assumptions are made at a particular moment in time and therefore may be unduly influenced by the demographic, economic, social and political conditions that have existed in the past and prevail at present. A population projection for Canada in 1939 assumed that Canadian fertility would continue to decline and that net migration is not likely to add significantly to the total population of Canada. Consequently the projection yielded a population of 15,401,000 for 1971 and 20,720,000 for 2300. However, Canadian population reached the 15-million mark as early as 1954 and the 20-million mark in 1967.

Ontario: Population Projections by Five-Year Age Groups, 1971-1991

Net Migration 50,000 Per Annum

Age Group	1971			1976			1981			1986			1991		
	Fertility Assumption			Fertility Assumption			Fertility Assumption			Fertility Assumption			Fertility Assumption		
	'A'	'B'	'C'	'A'	'B'	'C'	'A'	'B'	'C'	'A'	'B'	'C'	'A'	'B'	'C'
Thousands															
0-4	655.5	628.8	679.0	667.7	635.3	791.7	679.0	739.4	922.2	659.1	820.2	1,026.5	601.2	846.0	1,075.7
5-9	764.0	764.0	764.0	673.7	647.3	696.9	686.0	653.8	808.8	697.7	757.5	939.1	678.1	838.2	1,043.2
10-14	786.0	786.0	786.0	779.9	779.9	779.9	689.9	663.5	713.0	702.1	670.0	824.9	713.7	773.4	954.7
15-19	705.6	705.6	705.6	803.1	803.1	803.1	797.0	797.0	797.0	707.3	681.0	730.3	719.4	687.5	841.9
20-24	632.1	632.1	632.1	738.2	738.2	738.1	835.1	835.2	835.1	829.1	829.1	829.1	739.7	713.6	762.7
25-29	525.2	525.2	525.2	671.6	671.6	671.5	776.9	777.0	777.0	873.5	873.6	873.5	867.6	867.6	867.6
30-34	463.6	463.6	463.6	554.5	554.5	554.5	700.3	700.2	700.2	805.3	805.3	805.3	901.4	901.5	901.4
35-39	465.1	465.1	465.1	481.6	481.5	481.6	572.1	572.1	572.4	717.0	717.0	717.0	821.7	821.7	821.7
40-44	481.3	481.2	481.2	474.1	474.1	474.1	490.7	490.6	490.6	580.5	580.5	580.5	724.3	724.3	724.3
45-49	469.7	469.7	469.7	481.5	481.6	481.7	474.7	474.7	474.6	491.3	491.3	491.3	580.1	580.1	580.1
50-54	385.9	385.9	385.9	462.6	462.6	462.6	474.4	474.3	474.4	468.0	468.0	468.0	484.6	484.6	484.6
55-59	342.3	342.3	342.3	373.9	373.9	373.9	447.6	447.6	447.6	458.9	458.9	458.9	453.1	453.1	453.1
60-64	276.7	276.7	276.7	322.5	322.5	322.5	352.5	352.6	352.5	421.5	421.5	421.5	432.2	432.1	432.2
65-69	221.1	221.1	221.1	250.5	250.5	250.4	292.0	291.9	291.9	319.6	319.6	319.6	382.0	381.9	382.0
70-74	170.1	170.1	170.1	188.6	188.7	188.7	213.9	214.0	214.0	249.4	249.4	249.4	274.0	273.8	273.8
75-79	122.3	122.3	122.3	131.1	131.1	131.1	145.7	145.7	145.7	165.5	165.5	165.5	193.4	193.4	193.4
80-84	70.3	70.3	70.3	79.9	79.9	79.9	86.1	86.1	86.1	96.1	96.1	96.1	109.7	109.7	109.7
85-89	28.7	28.7	28.7	32.6	32.6	32.5	37.5	37.5	37.5	40.7	40.8	40.7	45.8	45.8	45.8
90+	11.5	11.5	11.5	12.5	12.5	12.5	14.2	14.2	14.2	16.6	16.6	16.6	18.7	18.7	18.7
Total	7,577.0	7,550.2	7,600.4	8,180.1	8,121.4	8,327.2	8,765.6	8,767.4	9,154.8	9,299.2	9,461.9	10,053.8	9,740.7	10,147.0	10,966.6

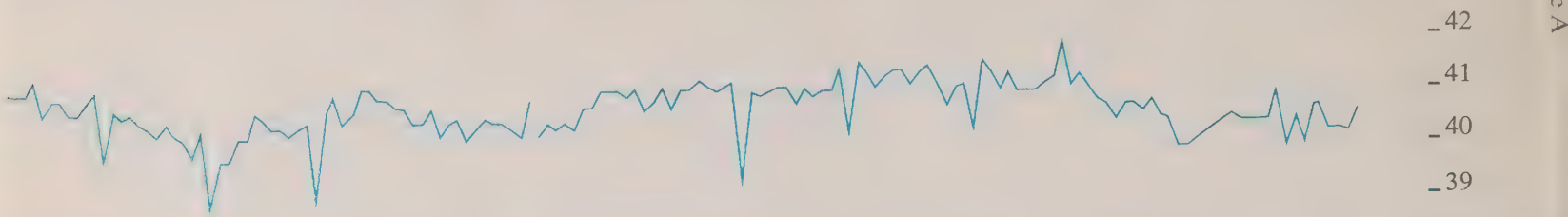
Net Migration 70,000 Per Annum

Age Group	1971			1976			1981			1986			1991		
	Fertility Assumption			Fertility Assumption			Fertility Assumption			Fertility Assumption			Fertility Assumption		
	'A'	'B'	'C'	'A'	'B'	'C'	'A'	'B'	'C'	'A'	'B'	'C'	'A'	'B'	'C'
Thousands															
0-4	668.3	641.1	692.1	693.6	660.5	821.6	713.0	775.8	966.6	697.4	866.7	1,083.2	642.5	902.1	1,145.2
5-9	773.0	773.0	773.0	695.4	668.6	718.9	720.9	687.8	847.8	740.5	802.8	992.3	725.3	893.4	1,108.8
10-14	793.0	793.1	793.1	796.0	796.0	796.0	718.6	691.7	742.1	744.1	711.0	870.6	763.5	825.7	1,014.8
15-19	713.4	713.4	713.4	817.9	817.7	817.9	820.5	820.8	820.7	743.6	716.8	767.0	769.0	736.0	895.2
20-24	646.4	646.4	646.4	760.0	760.0	760.0	864.1	864.1	864.1	867.0	867.0	867.0	790.1	763.5	813.5
25-29	542.2	542.1	542.2	702.7	702.7	702.7	815.8	815.8	815.8	919.4	919.3	919.3	922.2	922.2	922.2
30-34	476.4	476.4	476.4	584.2	584.2	584.2	744.1	744.1	744.1	856.6	856.6	856.7	959.8	959.8	959.8
35-39	473.4	473.5	473.5	502.6	502.6	502.6	609.9	609.9	609.9	768.9	768.9	768.9	881.1	881.1	881.1
40-44	486.6	486.6	486.6	487.7	487.7	487.7	516.7	516.7	516.7	623.4	623.4	623.4	781.2	781.2	781.2
45-49	472.9	472.9	472.9	490.1	490.1	490.1	491.4	491.4	491.4	520.3	520.3	520.3	625.7	625.7	625.7
50-54	388.2	388.2	388.1	468.1	468.1	468.1	485.0	485.0	485.0	486.5	486.5	486.5	515.2	515.2	515.2
55-59	344.3	344.3	344.3	378.1	378.1	378.1	454.8	454.8	454.8	471.1	471.1	471.1	472.8	472.8	472.9
60-64	278.2	278.2	278.2	326.0	326.0	326.0	385.1	358.1	358.1	429.9	429.9	429.9	445.1	445.0	445.0
65-69	222.4	222.3	222.4	253.2	253.2	253.2	296.3	296.3	296.3	325.8	325.7	325.8	390.7	390.7	390.7
70-74	171.2	171.2	171.2	190.9	190.9	190.9	217.5	217.4	217.4	254.0	254.3	254.3	280.2	280.2	280.2
75-79	122.7	122.7	122.7	132.5	132.5	132.4	147.9	147.8	147.8	168.6	168.6	168.6	197.6	197.7	197.6
80-84	70.3	70.3	70.3	80.1	80.1	80.1	86.9	86.9	86.9	97.5	97.5	97.5	111.8	111.8	111.8
85-89	28.7	28.7	28.7	32.5	32.5	32.5	37.6	37.6	37.6	41.2	41.2	41.2	46.5	46.5	46.5
90+	11.5	11.5	11.5	12.5	12.5	12.5	14.2	14.2	14.2	16.6	16.6	16.6	18.9	18.9	18.9
Total	7,683.1	7,655.9	7,707.0	8,404.1	8,344.0	8,555.5	9,113.3	9,116.2	9,517.3	9,772.4	9,944.2	10,560.2	10,339.2	10,769.5	11,626.3

Selected Economic Indicators

Leading Indicators

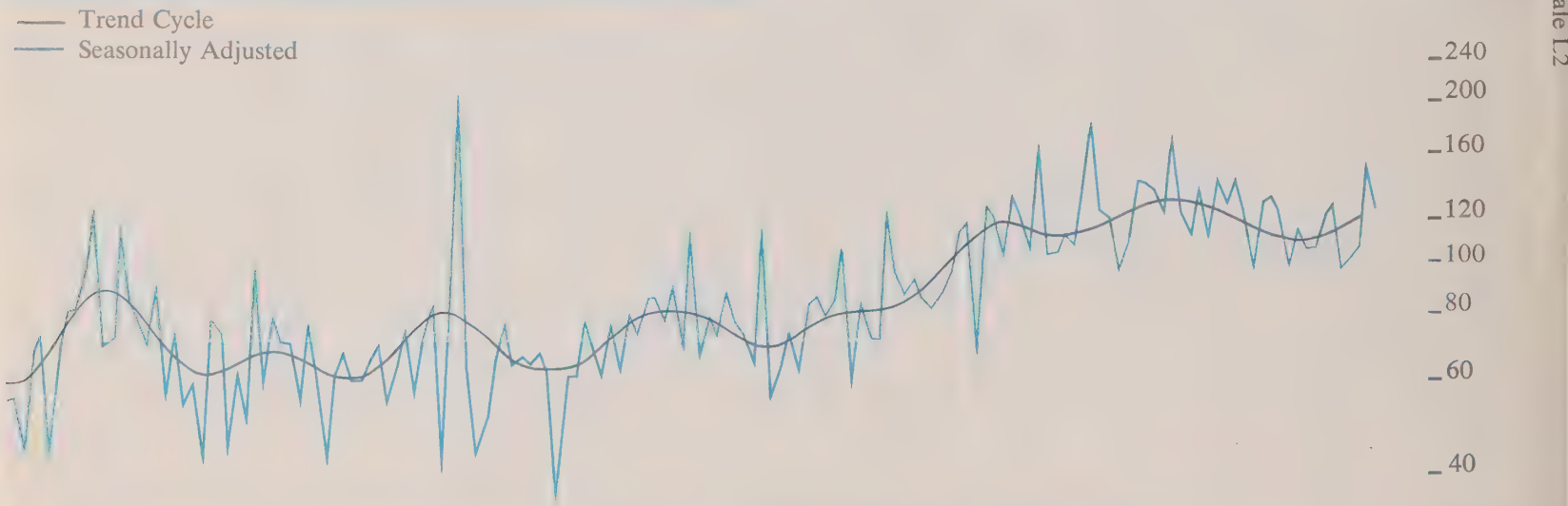
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



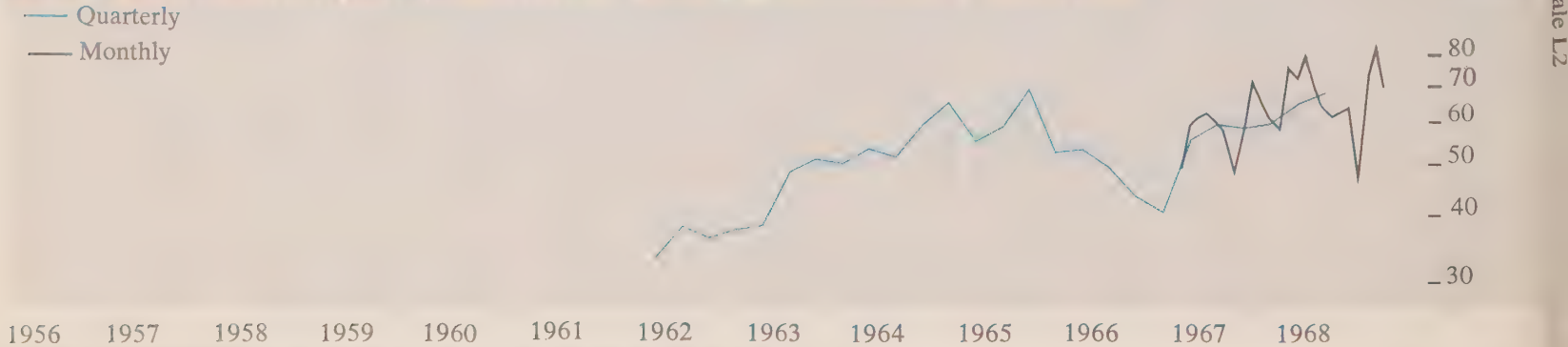
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Business, Industrial and Engineering Construction Contracts, Ontario

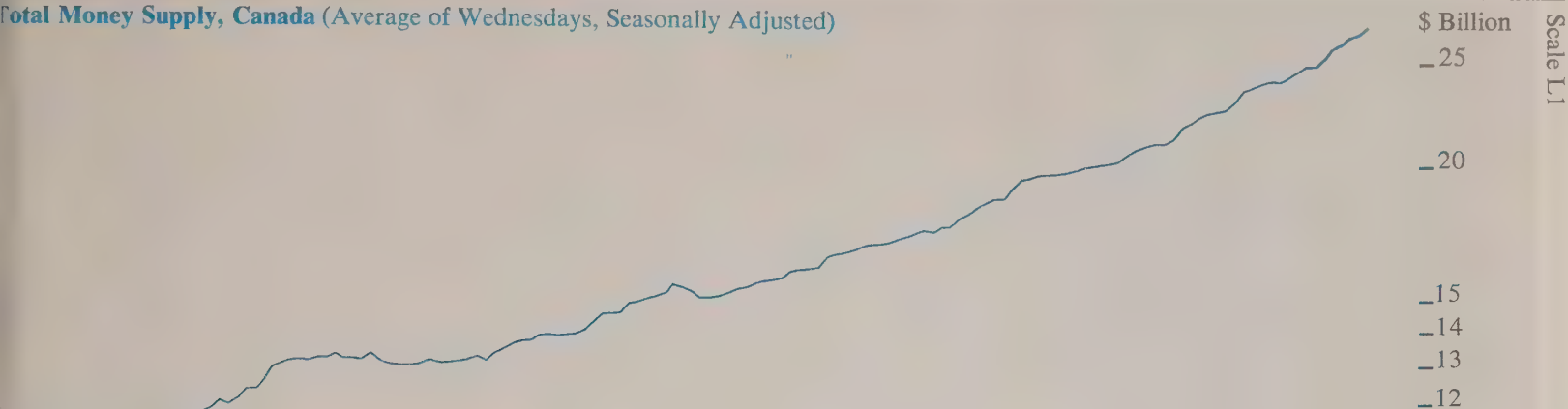


Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

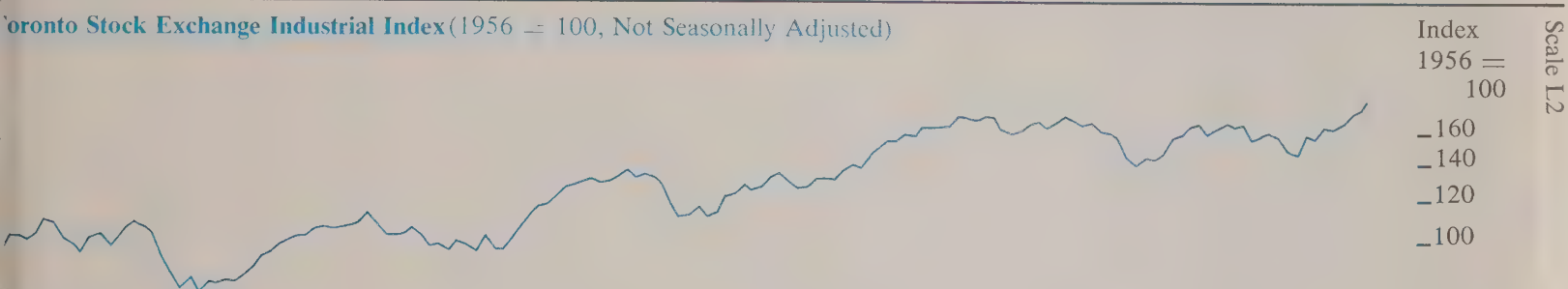


Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

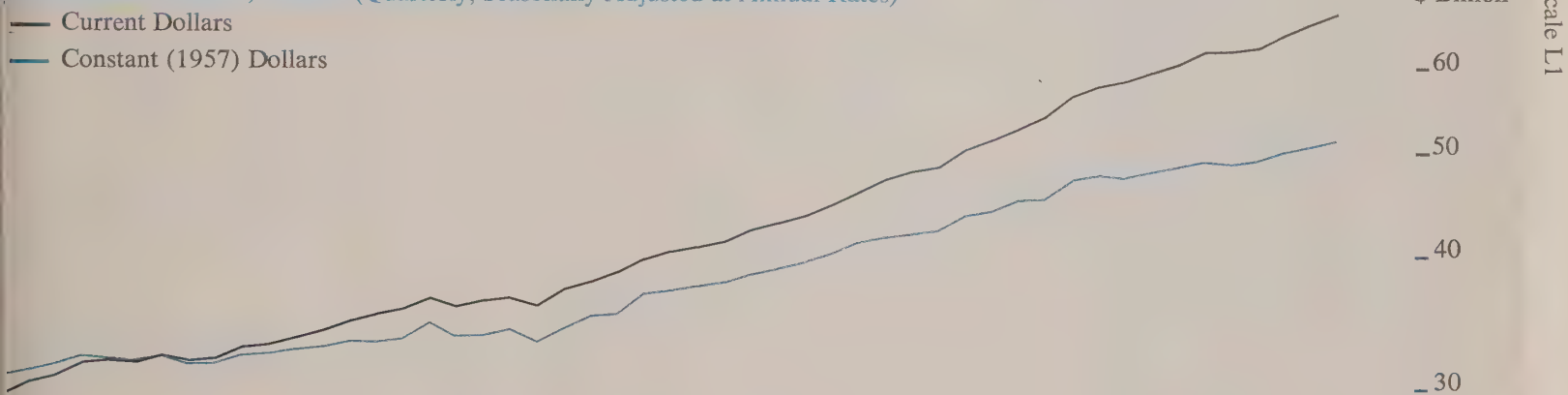


Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

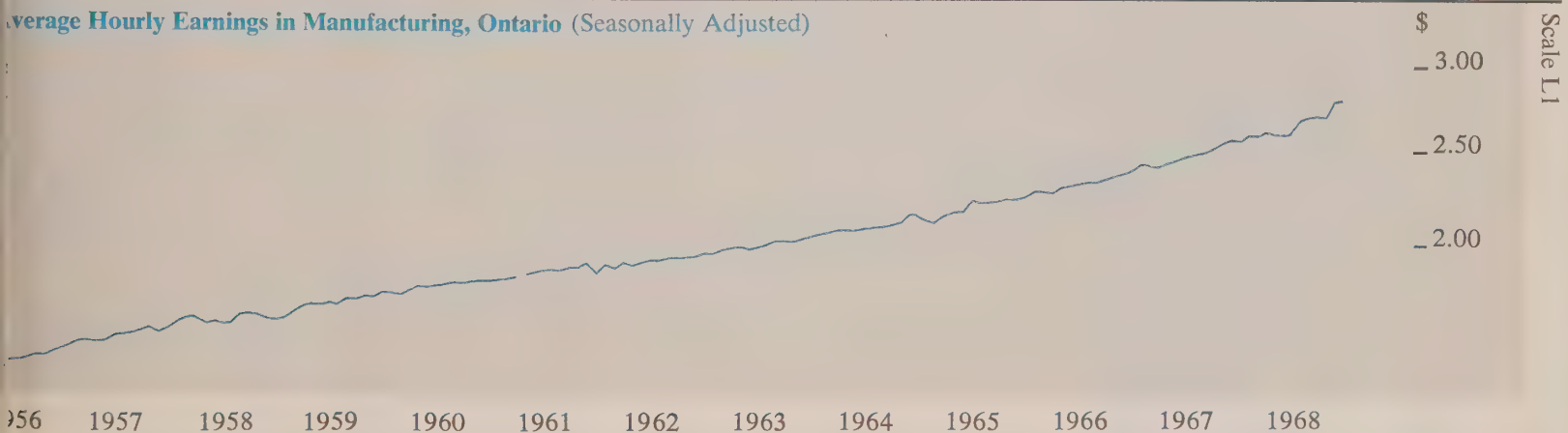


Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)



Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

%

Scale A



Employment, Ontario (Seasonally Adjusted)

Million

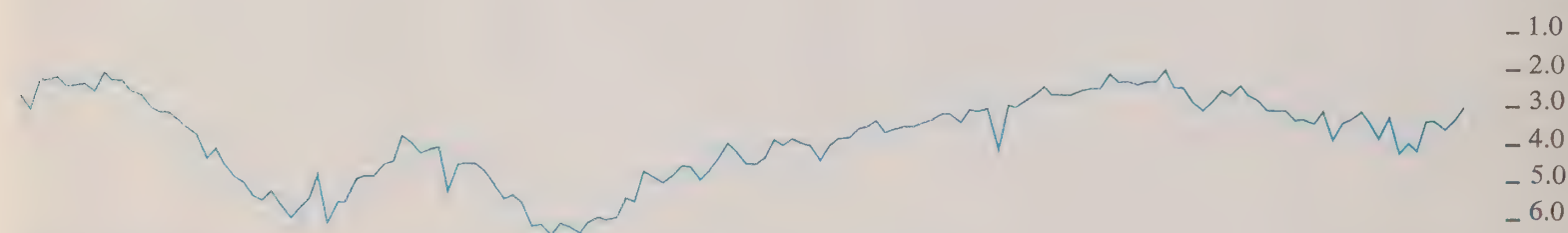
Scale L1



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of Labour Force

Scale A



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)

Index
1949 =
100

Scale L2



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Economic Indicators

Seasonally Adjusted

		1967		1968											
		Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Leading Indicators															
Average Weekly Hours Worked in Manufacturing	Number	40.4	40.9	39.9	40.5	39.6	40.6	40.7	40.3	40.3	40.2	40.6			
New Orders in Manufacturing Industries ^c	\$ Million	3,242	3,382	3,225	3,163	3,193	3,280	3,365	3,356	3,404	3,420	3,601	3,544		
Business, Industrial and Engineering Construction Contracts	\$ Million	133.0	125.4	105.4	111.3	104.6	107.1	123.4	129.3	97.7	101.8	107.8	154.4	125.0	
than Housing Starts (Annual Rate)	Number	61,000	58,700	76,600	72,700	79,400	69,200	63,200	60,800	61,900	63,900	48,900	73,400	83,500	69,325
Money Supply ^c	\$ Million	24,041	24,147	24,149	24,479	24,682	24,972	24,987	25,400	25,846	26,314	26,702	26,827	27,226	
TSE Industrial Index ^a	1956 = 100	161.60	162.28	157.43	150.24	146.88	160.43	157.87	166.61	165.93	169.02	176.37	179.61	187.29	188.93
Business Failures ^a	Number	43	73	54	59	87	52	50	46	49	28	36	46	48	
Business Failures - Liabilities ^a	\$ Million	2.9	24.3	2.6	1.8	5.6	6.4	2.8	6.6	2.9	1.3	1.5	2.1	2.5	
Coincidental and Lagging Indicators															
Gross National Product ^c (Annual Rate)	\$ Million		62,992			65,088			66,288			67,628			
Average Hourly Earnings in Manufacturing	Dollars	2.58	2.60	2.59	2.58	2.60	2.67	2.68	2.69	2.68	2.77	2.79			
3-Month Treasury Bill Rate ^a	Per Cent	5.46	5.95	6.29	6.80	6.98	6.99	6.95	6.56	6.03	5.48	5.66	5.57	5.66	
Cheques Cashed in Clearing Centres ¹	\$ Million	5,459	5,485	5,006	4,959	5,313	5,031	5,448	5,199	5,381	6,034	5,065	5,821		
Retail Trade	\$ Million	773	767	803	768	780	785	779	804	840	835	850	851		
Labour Force	000's	2,860	2,856	2,857	2,892	2,869	2,890	2,918	2,962	2,948	2,937	2,959	3,002	3,026	2,955
Employed	000's	2,764	2,762	2,769	2,793	2,760	2,796	2,796	2,844	2,825	2,837	2,858	2,890	2,923	2,865
Unemployed	000's	96	94	88	99	109	94	122	118	123	100	101	112	103	90
Unemployed as % of Labour Force	Per Cent	3.4	3.3	3.1	3.4	3.8	3.3	4.2	4.0	4.2	3.4	3.4	3.7	3.4	3.0
Wages and Salaries	\$ Million	1,086	1,094	1,111	1,103	1,107	1,130	1,141	1,141	1,142	1,157	1,182			
Index of Industrial Employment	1961 = 100	125.7	125.8	126.1	124.3	125.9	125.6	124.5	123.7	125.6	127.0				
Index of Industrial Production ^c	1961 = 100	154.5	156.8	153.8	153.9	154.9	156.8	158.4	160.1	159.5	159.3	161.4	163.0	164.7	
Total Manufacturing ^c		153.9	156.6	153.0	152.2	154.0	156.4	158.1	159.7	157.8	158.0	161.3	162.5	164.6	
Non-Durables ^c		139.3	140.1	138.8	141.9	145.7	143.5	142.8	146.1	142.1	139.8	142.8	144.0	147.4	
Durables ^c		171.8	176.7	170.4	164.8	164.2	172.2	176.8	176.2	177.0	180.2	183.9	185.1	185.7	
Mining ^c		150.8	152.2	145.8	152.8	152.4	153.3	153.1	154.6	156.1	154.3	152.9	155.1	155.1	
Electric Power and Gas Utilities ^c		165.4	165.5	172.9	170.0	166.6	165.7	169.1	172.1	179.9	179.0	177.5	179.6	179.7	
Primary Energy Demand (Annual Rate)	BKWH	53.86	53.78	55.60	55.15	54.01	53.94	53.81	53.83	55.92	55.69	54.83	57.09	57.89	
Exports (including re-exports) ^c	\$ Million	969.4	1,023.0	1,077.7	1,140.4	1,125.7	1,165.3	1,097.2	1,115.9	1,063.5	1,103.5	1,115.0	1,176.4		
Imports ^c	\$ Million	882.5	928.7	974.5	1,093.9	970.9	1,026.6	992.2	962.7	927.3	963.0	1,092.1	1,127.2		
Unclassified Indicators															
Foreign Exchange Reserves ^b	U.S. \$ Million	2,277	2,268	2,178	2,490	2,244	2,416	2,695	2,574	2,515	2,590	2,534	2,525	2,672	
Industrial Materials Price Index ^a	1935-39 = 100	252.9	254.3	253.5	252.4	253.0	251.2	252.0	253.0	253.4	254.2	253.4	256.8	257.1	260.8
Consumer Price Index ^a	1949 = 100	151.0	151.8	152.6	152.7	153.2	154.1	154.2	154.7	155.6	156.0	156.4	156.8	157.5	158.0

^cStatistics for Canada.

^aNot seasonally adjusted.

¹Ontario less Toronto.



Ontario Economic Review

Mar/Apr 1969
Volume 7, Number 2

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister



Ontario Economic Review

March/April 1969
Volume 7, Number 2

The Ontario Economy

The Solemnization of an Institutional Marriage

(or the joining of the "Treasury" with "Economics")

H. Ian Macdonald, Deputy Treasurer of Ontario
and Deputy Minister of Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 5, Ontario.

About the Review

The March/April edition of the *Ontario Economic Review* presents an article by H. Ian Macdonald, Deputy Treasurer of Ontario and Deputy Minister of Economics, on the reorganization of the Treasury Department in the Ontario Government.

On July 23, 1968, legislation creating two new departments — the Department of Treasury and Economics and the Department of Revenue — was proclaimed. These two departments separate the taxation policy and taxation administration functions of the former Treasury Department, following a recommendation of the Ontario Committee on Taxation. The separation has resulted in a finance department with varied policy and operating responsibilities.

In this article, Mr. Macdonald describes the functions and objectives of the new Department of Treasury and Economics in providing machinery for carrying out the Government's economic and fiscal policy as well as co-ordinating federal-provincial affairs. As the Government's finance department, it will also continue to develop and maintain government-wide accounts, including the overall financial records, to manage and administer the public debt of Ontario, and to propose taxation reforms resulting from evaluation of The Report of the Ontario Committee on Taxation among other sources.

Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

Ontario Budget 1969

In his third Budget Statement the Honourable Charles MacNaughton, Treasurer of Ontario and Minister of Economics, announced a balanced budget which proposes to raise \$181.0 million in new taxes and outlined a program of significant tax reform embracing the principal of a capital gains tax and a guaranteed annual income. His 1969 Budget, the first to be televised in Canada's history combined "drastic curtailment" of expenditures and a series of corporation and sales tax changes to achieve an estimated surplus of \$2.0 million for 1969-70.

In an accompanying White Paper entitled Ontario's "Fiscal Framework for the Future", the Treasurer indicated that the self-financing program for 1969-70 is the first essential step to set the stage for long-term reforms of the provincial tax system and deemed necessary until a more acceptable tax sharing arrangement with Ottawa is arranged and until pressure on the bond market and inflationary pressures have subsided.

For the coming fiscal year, Mr. MacNaughton achieved a balanced budget (the first since 1945) by holding expenditures to the \$3.0 billion target he had set out earlier this year in launching an austerity program for the provincial government. Provincial expenditures which have risen by more than 20 per cent in each of the three previous years will rise by only 7.5 per cent, considerably less than the federal government's increase of 9.5 per cent and slightly less than the anticipated increase of 7.8 per cent in gross provincial product for 1969.

Total expenditures will be \$2,996 million, compared with last year's \$2,787 million, for an increase of \$209 million. Revenue is expected to total \$2,998 million, a gain of \$478 million over last year's \$2,520 million.

To achieve this degree of restraint the Government has pared \$400 million from allocations requested by the various departments. Of the increase in spending, \$162 million — or approximately three-quarters — has been allocated to education, health, social services, and municipal aid, the areas to which the provincial government assigns highest priority. Over the past four years Ontario has progressively shifted more resources into these priority fields, raising their proportion to 71 per cent from 63 per cent of the total budget. Education programs will get the biggest portion of the increase, \$149

million, to raise their total to \$1,276 million. Health and social services will drop by \$12 million but aid to local authorities other than school board grants will rise by \$25 million. The increase in these priority areas will be 8.2 per cent compared with a growth rate of 5.8 per cent for non-priority areas. No new programs have been proposed and a comprehensive review of management structure and operations has been launched to streamline administration.

Predicting a continuation of tight money in North America, Mr. MacNaughton estimated that "capital will be in short supply and interest rates will probably remain at present levels until the latter part of the year when the effects of present policies may have worked to reduce inflationary pressures".

The necessity to combat inflation and build up an appropriate revenue base for long-term reforms persuaded the Treasurer to cover the prospective deficit by raising taxes. The existing tax system would have produced \$2,817 million leaving a budgetary deficit of \$179 million. After taking account of non-budgetary spending and revenues (including borrowing from the Canada Pension Plan), the cash needs totalled \$169 million.

The new taxes will raise \$181 million, producing the budgetary surplus of \$2.0 million and a surplus above cash needs of \$12 million. Corporations and mining companies will provide almost 60 per cent of the additional \$181 million in revenue, the remainder coming from increased levies on alcoholic beverages and cigarettes, the extension of the five per cent retail sales tax to hotel and motel room rates, and removal of refunds on gasoline purchases for boats and snowmobiles.

Ontario will require a speed-up in corporation tax payments to bring its payment schedule more closely in line with the federal government's new schedule. This is a one-time tax source which generates additional income only in the year of implementation and will have to be replaced in the next fiscal year. Corporation capital tax will also increase from 1/20th to 1/10th of one per cent, with a minimum of \$50, but the place-of-business tax will be abolished.

Corporations will also contribute the majority of revenue anticipated from the application of retail sales tax to production machinery now exempt. All equipment, except that used in farm production, will be subject to the present five per cent rate.

These changes affecting corporations, plus an \$8.0 million increase in the mining tax, will raise \$105.7 million of the additional revenues expected from tax changes. A large portion of these new taxes, however, can be written off against corporation income tax.

Retail sales tax on wine, liquor and bottled beer will be increased from 5 per cent to 10 per cent on April 1st to established a differential tax rate which will form part of the reform tax package for the future. This will apply to retail sales and consumption in licensed premises.

The exemption from retail sales tax on prepared meals will be raised from \$1.50 to \$2.50 but the new 10 per cent rate will apply over \$2.50. Amusements now subject to the 10 per cent hospitals tax will be brought under the new 10 per cent sales tax, and the present maximum of \$1.00 tax will disappear.

The tax on cigarettes will rise two cents (from six to eight) per package of 20, but the tax on other tobaccos will remain the same.

ESTIMATED INCREASE IN REVENUES FROM 1969 TAX CHANGES

\$ Millions

From corporations and mining companies

Speed-up of income tax payments	42.2
Capital tax increase (less abolition of place-of-business tax)	17.2
Application of 5% retail sales tax on production machinery	38.2
Mining tax increase	8.1
Total	105.7

From consumer

Retail Sales Tax

10% rate on all liquor, wine and bottled beer (both retail sale and consumption); meals over \$2.50; removal of \$1 maximum on entertainment (formerly under hospitals tax)	42.2
5% rate on hotel and motel accommodation	13.0
5% rate on rental of motion picture films and video tapes	2.0
Tobacco tax increase (cigarettes only)	16.6
Gasoline tax (removal of rebate on purchases for boats, snowmobiles) . .	1.5
Total	75.3
Total Estimated Increase	181.0

The Solemnization of an Institutional Marriage

(or the joining of the "Treasury" with "Economics")

H. Ian Macdonald, Deputy Treasurer of Ontario
and Deputy Minister of Economics

COURTSHIP...

On July 23, 1968, the Lieutenant Governor of Ontario gave Royal Assent to a bill which solemnized the marriage of two well-matched partners — the economics and finance functions of the Ontario Government. The marriage ceremony provided a basis of respectability for a relationship which had assumed varying degrees of propriety within a constant state of intimacy.

The Treasury Department, dating back to July 1st, 1867, had enjoyed a long and distinguished service as the finance department of the Ontario Government. It provided a core of advice and a centre of operations for budgetary policy, tax policy and tax collection, and the management of the public debt and government investments; it also functioned as the main source of government accounts and financial information. Skilful management and high professional standards had combined to produce financial conditions worthy of the Province's enviable credit rating in the capital markets of the world.

However, new dimensions were constantly being added to the requirements for economic and fiscal policy and to the character of Canadian federalism. Throughout the post-Keynesian western world in particular, appreciation of economic influences and sophistication in economic understanding was developing rapidly. Canada was also becoming an increasingly prominent nation in that world and Ontario an increasingly vigorous partner in the Canadian federal system. Just as the increase in the relative role of government evoked more intensive economic research among governments, a contemporary feature of Canadian federalism decreed that developments at the provincial level should be particularly pronounced. The burgeoning of activity in areas assigned constitutionally to the provinces — education, health, welfare and highways, among others — was producing a notable shift in the balance between federal and provincial-municipal activity. Today, approximately 60 per cent of government expenditure in Canada now rests with the provinces and municipalities and over 80 per cent of public capital investment is placed by these two levels of government. In fact, the budget of the Ontario Government is today over five times the size of the federal budget on the eve of World War Two. There can be no escape from the consequences of these facts: a large measure of fiscal policy is now the responsibility of the provinces in general and of Ontario in particular.

In the face of this situation, a skilled economics service became a necessity at a relatively early stage. As a result, "economics" has already enjoyed a distinguished history in the service of the Ontario Government along with a well-implanted tradition of professional standards among the staff. A close alliance of economics with finance also developed at a comparatively early stage, dating back to the establishment of the Bureau of Statistics and Research in 1943. Actually, the matrimonial metaphor being pursued in this article may be somewhat indecent because the Bureau was originally a progeny of the Treasury Department — a departmental branch. This particular branch was expanded into the Office of the Provincial Economist in 1954 and achieved full departmental status with the creation of a Department of Economics in early 1956.

In a sense, this event ushered in a period of common-law marriage, with the Treasury Department and the Department of Economics living within the community of a single Minister — the Treasurer of Ontario. Common-law marriage and co-habitation came to an end in 1961 when the Department of Economics (which for a brief period had been renamed the Department of Economics and Federal-Provincial Relations) was merged with the Department of Commerce and Development to form the Department of Economics and Development. Under the umbrella of this new community, "economics" resided for six years. During the last three years of that period, responsibility for economics, statistics, federal-provincial affairs and the regional development program was concentrated in a new division — the Office of the Chief Economist.

Despite a physical and administrative separation, the intimacy of "economics" and "finance" prevailed. Indeed, how could it have been otherwise? Fiscal policy demands economic guidelines and, in government, the budgetary program is surely the means by which economic policy is translated into action. Certainly, the view that the budget is an instrument of economic policy and that the expenditures program should be directed at the economic and social development of the province was well accepted. The 1966 Budget Statement described the Government's intention to establish clear policy priorities to ensure that expenditures would make the greatest contribution to the development of the province, to plan its financial and economic activity to achieve maximum

effectiveness, to co-ordinate government policies and programs designed to contribute to the economic development of all regions of the province, and to view all policies in the context of federal-provincial-municipal relationships. To serve these and other objectives, a Cabinet Committee on Policy Development was established, under the chairmanship of the Prime Minister, providing policy advice to the Executive Council.

Mutual interest and interdependence flourished throughout this period with the result that association became increasingly great. Finally, on December 15, 1967, the two "good friends" — economics and finance — became officially engaged within the Treasury Department and under the Deputy Provincial Treasurer (Finance and Economics). In the summer of 1967, the Ontario Committee on Taxation had recommended that the Treasury Department should become a centre for fiscal, budgetary, taxation and economic policy with the tax collection and tax administration functions becoming the responsibility of a new Department of Revenue. The traditional period of engagement, until July 23, 1968, provided for this change-over with the result that the Department of Revenue was born at the same time as the Department of Treasury and Economics. "Economics" and "finance" were now duly wedded and have since settled down to renovate the household, modernize the furnishings, amend the functions of some of the household staff, and plan for financial operations appropriate to a multi-billion dollar organization.

In passing, it is worthy of note that this union represents a significant step in public administration. It has been traditional to assume that the "treasury function" and the "economics function" have different conceptual orientation. Whereas the treasury was thought of in terms of keeping firm control over expenditures, raising the necessary financing and "keeping the books" of the government, the economist was more concerned with measures to ensure that the economy was managed in a manner that would enable it to achieve its full production potential — all of which frequently called for greater government expenditures. As a result, it has been frequently assumed that these two functions were equally important to government, but that they must necessarily reside apart. A clear example is evident in the recent history of Britain, where the Treasury was challenged by the creation of

a Department of Economic Affairs designed to produce long-term economic plans and economic policy, to alleviate economic bottlenecks, and to facilitate the maximization of economic growth. In other jurisdictions, a small economic agency, often of 'secondary importance, has been created within the treasury realm. However, all of these measures were merely a reflection of the relative size difference of economics and finance and the improper assumption that, somehow, they were incompatible and must live apart. Public administration followed a course of accepting an apparent axiom rather than challenging it. Of course, the very decision to set these communities apart tended to confirm the axiom and vitiate any opportunity for its contradiction. Because these communities were conceived to be incompatible, they tended to become incompatible.

The creation of the Department of Treasury and Economics represents a challenge to the conventional wisdom and a conscious relief by the Ontario Government that economic policy and economic planning are not only inherent parts of fiscal and financial policy but, indeed, also the very basis for forecasting, planning and setting fiscal goals. The role of a sensitive and creative finance department is not simply one of managing money, balancing the books, or raising revenue to finance the inevitable — important as those tasks may be. It is a matter of determining what part public expenditure should play in creating an atmosphere in which economic development can take place and in which economic growth will flourish. It is a matter of assessing the potential of the economy and determining how the extent, location and timing of public expenditures and the provision of social capital will assist the development of the economy, upon which all social progress must rest. In other words, it is a matter of determining objectives of expenditure, setting priorities, and planning the road between actions and ends.

Economics, then, is not parallel to engineering or operations research in the sense of being purely a technical apparatus. In the economic policy sense, it is a collection of fiscal and financial policies designed to achieve goals, which the technical or analytical portion of economics has helped to determine. Consequently, the Department of Treasury and Economics has assigned not a minor, or even a secondary place, to economics, but a prominent role in policy formu-

lation. Although the Department may not be unique, neither has it many counterparts. The relative novelty of its existence means that its objectives must be constantly explained, vigorously pursued and assiduously scrutinized. The delicacy of the judgment required involves a sensitive touch and a comprehensive view. Those who labour at these tasks will always require great reserves of patience to endure the conventionally-minded, a high degree of self-confidence to persuade the doubters, a clarity of mind to explain the complexity of the role to the astigmatic, and a layer of toughness to withstand the opposition of the fearful. Nor would any of those qualities be adequate without a constant capacity, within the organization, for self-criticism and self-questioning. Above all, without a commitment to intellectual honesty, the whole exercise is certain to founder.

... AND COMMITMENT.

"The Treasurer shall direct and control the Department of Treasury and Economics, recommend to the Executive Council financial, economic, accounting and taxation policy, advise on federal-provincial affairs, manage the Consolidated Revenue Fund and all public money and supervise, direct and control all financial, economic, statistical and accounting functions not by law or by the Lieutenant Governor in Council otherwise assigned."¹

Traditionally, the broad term "Treasury" in the Ontario Government referred to the tax collection operations, taxation policy, overall financial policy and money management, along with the expenditure control functions of the Treasury Board and Treasury Board Secretariat. With the responsibility for tax collection and tax administration assumed by the Department of Revenue, the economic research and planning function, federal-provincial affairs, the regional development program, and statistical affairs were brought together with the financial and accounting responsibilities of the former Treasury Department. Meanwhile, the Treasury Board continued its responsibility for expenditure control, administrative policy and administrative co-ordination.

Four divisions have been created in the Department as follows:

- The Policy Planning Division
- The Finance Division

- The Government Accounts Division
- The Economic and Statistical Services Division.

In essence, the functions of the department can best be described in terms of the first three divisions, with the Economic and Statistical Services Division designed to provide basic services to the other divisions and other departments. Attached administratively to the department, as a ministerial agency, is the Computer Services Centre which provides, under the policy guidance of a Computer Services Board and the chairmanship of the Deputy Treasurer, computer services to five government departments and several other agencies, including Treasury and Economics and Revenue. The basic administrative services for the department, as well as for the Treasury Board Secretariat, are provided by the Administrative Division of the Department of Revenue.

THE FUNCTIONS OF THE DIVISIONS

THE POLICY PLANNING DIVISION

In broad terms, this division provides a core of advice on policy planning to the Prime Minister, the Treasurer and the Cabinet Committee on Policy Development. The division through its four branches:

- recommends alternative provincial and regional economic targets and goals;
- assesses revenue prospects and recommends overall limits of expenditures for the budget and capital outlays;
- recommends economic and fiscal policies which ensure that targets are achieved in a consistent and economical manner;
- suggests priorities for expenditures, programs and policies in order to obtain desired economic and financial returns;
- designs regional development plans for the government's regional development program;
- advises on the overall consistency of government policy in federal-provincial matters, supports the work of the Ontario Advisory Committee on Confederation and fills a staff function for the Prime Minister;
- assesses the merits of alternative taxes and proposes tax policy and reforms.

At the same time, the division is equipped to assist other departments in relating departmental research and proposals to the whole provincial economy, and by clarifying the

¹The Financial Administration Act, 1968.

degree to which these proposals are consistent with provincial economic targets and goals.

Economic policy planning is now well recognized as a legitimate research and policy function within government. In North America, economic planning operates, by and large, through the instrumentality of government spending rather than by direct controls over the activities of the private sector. The North American connotations of the words 'economic policy planning' are much softer, though not less important, than they are in Western Europe where the tradition of direct governmental intervention is strong and well entrenched.

Five categories of economic planning can be identified and distinguished:¹

- *aggregate*, concerned with general levels of output, income, employment, consumption, investment, balance of payments;
- *cross-sectoral*, concerned with the supply and distribution of specific resources such as manpower, goods, credit, information;
- *sectoral*, concerned with various sectors of economic activity such as manufacturing, transportation, agriculture, education;
- *enterprise*, concerned with the planning of public, private or mixed types of institutions engaged in provision of goods and/or services;
- *spatial*, concerned with the geographic distribution of activity and co-ordinated area development.

Within the Policy Planning Division, the first three areas of economic policy planning — aggregate, cross-sectoral, sectoral — are the prime concerns of the Economic Planning Branch. Responsibility for the fourth area, enterprise (budgetary) planning, falls to the Taxation and Fiscal Policy Branch. The fifth area, spatial (regional) planning, is carried out in the Regional Development Branch which ties in with the Economic Planning Branch on the regional implications of sectoral and cross-sectoral planning.

Economic Planning Branch

Much of the research and policy output of the Economic Planning Branch, with respect to social and economic change, becomes an input for other user branches within the Policy Planning Division. For example, changes in the structure of provincial output, income and employment as revealed through relative shifts in sectoral activity associated with, say, manufacturing or transportation,

will be reflected in the spatial distribution of economic activity. Similarly, evaluations and analyses of the significance of changes in current and anticipated levels of particular economic variables will have a profound bearing on the form and type of instruments of financial policy recommended by the Taxation and Fiscal Policy Branch for implementation in the provincial budget.

One of the fundamental objectives of economic policy planning in Ontario is the achievement of a high and substantial rate of real economic growth as measured in general levels of provincial output, income, employment and investment, together with improvements in the particular social and economic well-being of Ontario residents. Thus, the Economic Planning Branch:

- frames, prescribes, and recommends broad economic policies, goals, and alternatives for adoption by the government;
- recommends various courses of action in terms of public policy alternatives, either to advance the growth or retard the stagnation of particular sector(s) in the provincial economy;
- tests and evaluates individual policy recommendations for conformity with overall provincial policy objectives and goals.

In the area of economic research, the Economic Planning Branch examines the symptoms, causes and effects of structural and other change in the various forms of economic activity in the province brought about by differential shifts in the demand for or supply of manpower, capital, natural resources, technology or other factors. The analysis of trends, projections and estimates of structural and other change is undertaken at suitably appropriate aggregate levels. As a result, economic research and policy planning are undertaken in the following areas:

- aggregate analysis of the Ontario economy, including economic forecasting, the establishment of targets and objectives, the identification of problem areas and bottlenecks, and the establishment of aggregate policy guidelines for the economic activities of provincial government departments and agencies;
- sectoral studies relating to the supply and distribution of specific resources, both human and material, and the development of policy proposals for government action within individual sectors or areas.

Such research and policy analysis takes into account current and anticipated trends and structural changes not only in the provincial economy but in the national economy as well. Furthermore, the branch examines all other international economic developments that may have a distinct bearing on the Canadian and Ontario economies.

However, economic planning is more than an attempt to reach satisfactory levels of income and employment. It involves a concern for and research into social welfare and the well-being of individuals. Such attention to people, and not just economic processes, begins with careful analyses of the labour force and its characteristics and extends to research on, and recommendations for, the planning of social welfare and other services to people.

In addition to formulating a realistic set of targets and achievement standards for the performance of the provincial economy, the Economic Planning Branch is also developing significant measures of the rate of change and direction of economic activity in the economy and its key sectors. Such measures should be capable of identifying bottlenecks or impediments in the growth process.

Another important responsibility of this branch is that of establishing economic priorities for the provincial budget. These priorities assist the Government in directing its economic activities in such a way as to obtain the best use of its resources, thereby contributing to advances in the economy as a whole. Associated with this responsibility is the establishment of measures to gauge the effectiveness of public policy responses to economic change at all levels of government — federal, provincial and municipal.

The Economic Planning Branch, either on its own initiative or at the request of the Policy Planning Division and other Ontario Government departments and agencies, recommends, tests and evaluates issues and policies of broad public concern. Included in these activities is the provision of advice and counsel for other government departments and agencies. These responsibilities are as multiple and complex as they are basic and are handled by senior economists who have specialized in research on an individual sector of the economy and government economic programs in the same area.

The Taxation and Fiscal Policy Branch

The functions of this branch are best explained in terms of its responsibility for the

¹These five categories were originally suggested in Bertram M. Gross, *Depth Studies on National Planning in the U.S., 1964* (mimeo).

preparation of the Government's annual Budget Statement and Budget Papers. Since the budget is the central instrument for the implementation and co-ordination of the Province's economic and fiscal policy, the budgetary process requires continuous review of its various components. Attention must be concentrated on matters such as:

- the growth and impact of expenditures; revenue forecasting;
- taxation analysis;
- federal-provincial and provincial-municipal fiscal and financial relations;
- analysis of capital market conditions and the Province's debt operations;
- the options for financing government expenditures;
- variation in cash flows.

In recent years, the Government's expenditures have grown rapidly in response to the heavy demand for public services and facilities in areas of provincial jurisdiction. This rate of growth emphasizes the urgent need to allocate scarce funds in ways which maximize specific social and economic benefits, while simultaneously employing the Government's overall fiscal leverage as a positive instrument for securing stable economic growth. Consequently, this branch is engaged in extensive research in the economic impact of expenditures. As part of the new planning-programming-budgeting system approach to program management, all expenditures are recorded in terms of "economic objects" to provide a detailed profile of the Government's use of economic resources. These data provide inputs for sectoral and econometric models of the economy which, in turn, trace the effects of expenditures through the economy in terms of their impact on incomes, employment and prices. To facilitate this process and to provide expenditure data in a form suitable for economic analysis, the provincial budget is being converted to a "national accounting" basis. These procedures will require the support of the Economic and Statistical Services Division as described in that section of this article.

On the basis of this research, and in close collaboration with the Treasury Board Secretariat, the branch prepares global expenditure guidelines which are reviewed by the Treasurer of Ontario and the Cabinet Committee on Policy Development. From this

review, a framework of approved expenditure guidelines is developed for the annual budget. These guidelines cover, first, the total level of spending appropriate to the Province's forecast financial capacity and evolving economic conditions; and, secondly, the allocation of funds among programs on a priority basis.

In the area of budgetary finance, the branch is responsible for preparing detailed financing plans for the annual budget. In the first instance this involves forecasting the revenue yields of existing tax bases and rates, based on the calculation of the revenue sensitivity of all taxes to anticipated changes in relevant economic variables. Because of the critical importance of accurate forecasting, considerable effort is being devoted to the development of more sophisticated techniques involving computer analysis of taxation data. Given the basic revenue forecasts, the branch studies the range of alternative financing methods which might be used in meeting any excess of expenditure growth over normal revenue increases. This requires the delineation of tax-change options, where attention is given to such factors as revenue yield and economic and income-redistribution effects, and the consideration of the scope for debt financing and the use of liquid reserves.

Closely allied to taxation and financial analysis for any particular budget is the question of long-term taxation. In recent years, considerable attention has been devoted to the need for basic tax structure reform, both in order to provide a viable financial basis for government operations and to allow tax measures to be used as effective economic and social policy instruments. Over the past year, the branch has undertaken a detailed study of the implications of The Report of the Ontario Committee on Taxation (The Smith Report) and of The Report of the Select Committee of the Legislature (The White Report). Following this review, the branch prepared the recent White Paper on "The Reform of Taxation and Government Structure in Ontario", which provides a comprehensive blueprint for provincial-municipal taxation reform in Ontario. In addition, the branch has been responsible for a similar analysis of The Report of the Royal Commission on Taxation (The Carter Report). As a second stage, the branch will be responsible for developing the government's intentions on taxation reform into operational form and for co-ordinating their im-

plementation by the various departments concerned.

Developments in federal-provincial fiscal and financial relations are also of basic importance to Ontario's budgetary planning. This requires continuous analysis of the complex range of intergovernmental tax-sharing and cost-sharing arrangements and participation in the process of policy consultation and co-ordination. Particular attention is, therefore, given to preparation for the periodic meetings of the Tax Structure Committee, the Continuing Committee on Fiscal and Economic Matters, and the Ministers of Finance. The results of these negotiations and consultations are analyzed and feature as basic parameters in developing the Province's short-term budgetary actions and long-term plans. The branch is also involved, with the Federal-Provincial Affairs Secretariat, in studying the economic and fiscal implications of continuing constitutional discussions.

Because of the importance and complexity of the Government's annual budget as a fiscal plan, considerable attention is being given by the branch to refining the basic systems of the budgetary process. First, the relative inflexibility of commitments dictates longer-term expenditure planning. This, together with the long-term tax reform program, will provide increased continuity and perspective to annual budget planning. Similarly, work is underway to improve the range of budgetary planning and consultation between the provincial government and municipalities and other public institutions and agencies. Secondly, a more sophisticated financial information system is being developed in co-operation with the Government Accounts and Finance Divisions of the department. This will provide a better means of assessing the in-year performance of any given budget plan in response to changing conditions, and for providing a smoother financial lead-in to the next budget.

Considerable progress has been made in improving the clarity of the annual budget presentation to the public. Over the past two years, the Treasurer's Budget Statement has been re-designed to provide better explanations of government policy intentions and operations through the use of supporting Budget Papers and the introduction of a new system of financial accounts. Other versions of the public statements and accounts are being revised to conform with the new accounting format. This re-design will permit

the incorporation of further refinements as the new budgetary systems become fully operational.

Continuing refinement of the Government's economic and fiscal policy will depend greatly on improvement in both quantitative and qualitative analysis. The analysis, in turn, is heavily dependent upon an improved flow of compatible data. The 'data-generators' and 'data-processors' are as critical to good policy-making as the computer is to a moon-shot. For this reason, we have placed the highest priority on the aggregation and analysis of economic data in the Economic and Statistical Services Division and the development of a modern "financial information system" based on advanced accounting techniques.

Regional Development Branch

In a series of policy statements, starting with the Prime Minister's White Paper *Design for Development* issued in April, 1966, the Government of Ontario accepted the responsibility for guiding, assisting and encouraging the orderly development of the province. The three basic objectives of the overall regional development program, as set forth in these policy statements are:

- to encourage each region of the province to achieve its socio-economic potential, in harmony with the overall provincial interest and development;
- to encourage careful use of the natural environment;
- to improve both the efficiency and effectiveness of provincial departmental services.

The institutional machinery established to carry out these objectives consists of the following:

- The Cabinet Committee on Policy Development. This committee is chaired by the Prime Minister and includes six other ministers. The Secretary to the Cabinet serves as Secretary and the Deputy Treasurer and the Secretary of the Treasury Board as advisers.
- An Advisory Committee on Regional Development. Chaired by the Deputy Minister of Treasury and Economics, this committee is comprised of representatives from the departments of Agriculture and Food, Energy and Resources Management, Highways, Lands and Forests, Municipal Affairs, Trade and Development,

Tourism and Information and the Department of the Prime Minister.

- Regional development councils. A council has been established for each of the ten economic planning regions of Ontario and is supported financially by both the provincial government and the municipalities, with membership selected by the latter. The councils' role is basically an advisory one. In March 1968, each council was asked to submit to the Treasurer of Ontario and Minister of Economics, by the end of November, 1968, a formal statement of its major development problems and its recommended solutions and priorities. This has now been carried out.
- Regional advisory boards. These advisory boards are comprised of senior civil servants from those provincial departments which have field offices and are represented on the Advisory Committee. One board has been organized for each planning region.
- The Regional Development Branch of the Department of Treasury and Economics. This branch consists of three main sections; services, research and special projects. The branch is responsible for the preparation of comprehensive regional development plans for consideration by the Advisory Committee. These plans will be based in part upon the recommended programs of both the regional development councils and the regional advisory boards, and in part upon the results of research carried out by Ontario universities, by other departments and by the branch itself. Once these plans are developed, they will be forwarded to the regional development councils for "grass-roots" reaction, before proceeding to the Advisory Committee and, ultimately, to the Cabinet Committee for consideration.

The regional development program has moved forward rapidly since January, 1968. Among its achievements are the following:

- An inventory of all programs, policies and data of provincial departments that might be of value to an emerging regional development program was initiated early in 1967 and was completed by the end of the same year.
- An evaluation of certain basic trends, on as fine a geographic mesh as possible, was begun late in 1967 and completed by the end of 1968. Changes in population, in-

come, labour force, and primary, secondary and tertiary activities in each area were compared with changes in the province as a whole. Three types of region are expected to emerge from this study. One is a region of *self-sustained growth*, in which the major problems are those of space adjustment. A second is that of *inconsistent or fluctuating growth*, in which some assistance may be necessary in order to bring the region to its full potential. A third is that of *slow growth* to which major assistance may be necessary if the region is to achieve its potential.

- The planning stage, the logical continuation of the two previous steps, is expected to begin this year. The first stage will emphasize solutions to problems of an economic and social nature, and improvement in both the efficiency and effectiveness of provincial government services. The closely related question regarding careful use of the natural environment will be given attention in a second stage. In developing plans for the province, the Regional Development Branch will be particularly interested in the selection of appropriate growth centres and poles for the three types of region noted here. The functions of such growth points in regions of self-sustained growth will be to *channel* rather than *stimulate* economic activity. In fluctuating growth, some stimulation may be necessary; in slow growth, major stimulation may be necessary. The first responsibility in devising the plans will be to select the central places, large and small, which will become appropriate growth points for the type of region in which that point is found. This process will be closely co-ordinated with the emerging pattern of regional governments across the province.
- Early in 1968, a dynamic university research series was initiated, the results of which are already beginning to be useful in Ontario's development program. Each of Ontario's fourteen provincially-supported universities has undertaken at least one research project on some aspect of regional development including recreation, agriculture, industrial location and transportation.
- A study of the Niagara escarpment, co-ordinated by Professor L. O. Gertler of the University of Waterloo, was begun by the branch early in 1967 at the request of

the Prime Minister. The three-part study was concluded and submitted to the Government earlier this year.

- In April 1968, an ARDA¹ study of the most populated portion of North-western Ontario was undertaken by the branch, under joint federal-provincial support and supervision. An economic base study of the area is currently underway and a first report will be made this year.
- A Goals Plan Study Committee, comprised of the same departments as represented on the Advisory Committee, was established to review the reactions to the Goals Plan presentation — a product of the Metropolitan Toronto and Region Transportation Study (MTARTS) — and to submit recommendations to the Advisory Committee. Because of the close timing between the planning stage of the Regional Development Branch and the release of the Goals Plan Study, this Committee has also been instructed to act as a sounding board for regional development principles involving metropolitan areas and immediately adjacent territories. Thus, a smooth transition will be established from the Goals Plan Study, released in June, 1968, to the emerging regional development program.

The attention which this program and policy has attracted, not only in other parts of Canada but internationally, is a measure of the vitality and variety of its development.

The Federal-Provincial Affairs Secretariat

The provision of advice to governments, on a full-time basis, concerning what might broadly be termed intergovernmental relationships is a relatively new development in Canada. Today, only three governments in this country — those of Canada, Ontario and Quebec — have staffs who deal exclusively with this subject.

The growing national concern about constitutional and fiscal matters was reflected in a decision by the Government of Ontario, in January 1965, to establish the Ontario Advisory Committee on Confederation (OACC). Several factors motivated the Government to take this step:

- a desire to participate fully in the debate on the future of Canadian federalism;
- a need to examine the position of Ontario within Confederation;

- a recognition of the changing nature of federal-provincial and interprovincial relationships.

The Advisory Committee is composed of a number of prominent persons, primarily from the university community, under the chairmanship of the Deputy Treasurer. The first results of its work were published in 1967 in the volume *Background Papers and Reports*. The Committee plays an important role in advising the Government on many matters pertaining to the current Confederation debate. It is a unique body in the sense that no other government in Canada receives regular advice from such a formally constituted group of non-government experts.

The Government's continuing concern led to the next logical step, in March 1966, when the Federal-Provincial Affairs Secretariat was created as part of the Office of the Chief Economist. Since its formation, the Secretariat's activities have centred around three major areas:

- constitutional matters;
- cultural and linguistic questions;
- the machinery of intergovernmental relationships.

In conjunction with the OACC, the responsibility of the Secretariat is to develop recommendations for the Government's consideration on these subjects and, at the same time, to provide the necessary perspective on intergovernmental relationships in Canada in an effort to support a consistent and progressive set of policies on these issues.

A brief review of each of these three areas of concentration may provide a better understanding of the functions of the Secretariat.

• Constitutional matters

In the past year or so, the Secretariat was closely involved with a variety of meetings dealing with constitutional issues:

1. November, 1967 — the Confederation of Tomorrow Conference;
2. February, 1968 — the Constitutional Conference of Prime Ministers and Premiers;
3. May, 1968 and following — the Continuing Committee of Officials on the Constitution (CCO);
4. February, 1969 — the Second Constitutional Conference of Prime Ministers and Premiers.

The Continuing Committee of Officials was established at the closing session of the February 1968 Conference to carry forward the discussions initiated at that Conference and at the Confederation of Tomorrow Conference. The Committee consists of senior civil servants from the eleven governments in Canada and is supported by a full-time staff, responsible to all governments and located in Ottawa. The CCO submitted a report on the first phase of its work to the Second Constitutional Conference in February. The widespread character of this novel process of constitutional review is evident from the range of subjects which the CCO is considering. These include: the official languages, fundamental rights, the distribution of powers, the machinery of intergovernmental relationships, an amending procedure, and so forth.

Since the CCO was established, the Secretariat has collaborated closely with the Department of the Attorney General in preparing Ontario's contributions to these meetings. The results of these initial contributions were tabled in the Ontario Legislature on February 5, 1969, in a booklet entitled *Propositions of the Government of Ontario*.

The work of the CCO and several new ministerial committees will continue as a result of the conclusions of the recent Constitutional Conference, which reaffirmed the intent of the eleven governments to complete a comprehensive review of the Constitution of Canada and instructed that the process of review should be accelerated.

• Cultural and linguistic questions

Several events since 1967 have involved the Secretariat in studies on the question of the place of the English and French languages in Canada, such as:

1. The Reports of the Royal Commission on Bilingualism and Biculturalism. In December 1967, the first volume of the Report of the Royal Commission on Bilingualism and Biculturalism, entitled *The Official Languages*, was published. In December 1968, the second volume, entitled *Education* was issued. The Secretariat provided the Government with an analysis of the contents of these two volumes, and will do the same with succeeding volumes as they appear.
2. The Task Forces on the use of English and French in Ontario. In February 1968, Prime Minister Robarts announced the

¹Agricultural Rehabilitation and Development Act.

establishment of four task forces to study the administrative use of French in Ontario. The four areas of study were: municipal administration, the administration of justice, the provincial public service, and the Legislature and provincial statutes. Along with officials from the operating departments concerned with each of these areas, members of the Secretariat helped to staff these task forces, provided research assistance, and assisted in the preparation of the final reports. The reports and recommendations of all four task forces were submitted to the Prime Minister in October 1968.

3. The Official Languages Sub-Committee of the CCO. In addition to studying the provision of French-language services at the provincial level, the Secretariat has participated in discussions at the inter-governmental level on many aspects of bilingualism. When Canada's Prime Ministers and Premiers established the CCO, they attached to it a Sub-Committee on Official Languages to serve as a forum in which the views of all governments on questions related to bilingualism in Canada could be presented. Members of the Secretariat are among Ontario's representatives at these meetings.
4. French-language schools. The Secretariat's concern with these schools, which were established by legislation in July 1968, arose as a result of its involvement with the question of providing French-language services in the province. During the past year, a member of the Secretariat served as Secretary to the Department of Education's Committee on French-language Schools whose report was recently published.

• *The machinery of intergovernmental relationships.*

Two points deserve special emphasis in connection with the Secretariat's work on the machinery of intergovernmental relations. First, "intergovernmental machinery" is a relatively new area of study now being undertaken by some governments in Canada. Second, it is an area which has become increasingly important as the necessity for more sophisticated intergovernmental relations in Canada is made evident.

In recent years, Canada has witnessed a proliferation of well over 100 intergovernmental committees, sub-committees, councils,

conferences and commissions. While governments recognize that increased intergovernmental contacts — on the international, the federal-provincial and the interprovincial planes — are not only desirable in themselves but also highly necessary to the functioning of a healthy federal system, they are also becoming increasingly aware of the need to achieve better co-ordination of these enlarging relationships.

Within this perspective, the Secretariat has been assigned the task of analyzing the existing structure of Ontario's relationships with other governments. During the past year, at the request of a variety of departments, a staff member from the Secretariat has attended, as an observer or participant, inter-governmental meetings at the ministerial and official levels on such matters as consumer affairs, resources, transport and welfare.

In addition to its activities in the three main areas, the Secretariat provides support staff for the OACC, preparing agendas for its meetings, distributing pertinent material to its members, and producing studies for its consideration.

Along with the two publications previously mentioned in this article, the Secretariat also prepared the following volumes for publication:

1. *Quebec in the Canada of Tomorrow* — an English edition of a supplement which originally appeared in the Montreal newspaper *Le Devoir*;
2. *Confederation of Tomorrow Conference Theme Papers* — a collection of five papers on the agenda of the Conference;
3. *Confederation of Tomorrow Conference Proceedings* — the verbatim record of the Conference.

As a continuing information service, the Secretariat produces in translation a monthly summary of editorial opinion from the French-language press in Canada. While the summary is not yet available for general public distribution, it is sent to many persons within the Government of Ontario and in all other governments in Canada.

Finally, the Secretariat attempts to maintain close intragovernmental contacts in order to keep itself informed on the technical problems pertaining to intergovernmental relations which confront the operating departments and agencies of the Government of Ontario. With such contacts and the understanding which results from them, the Secretariat is better able to provide useful policy

options and advice on the complex and varied issues confronting contemporary Canadian federalism.

THE FINANCE DIVISION

The basic task of the Finance Division is the management and administration of the public debt of Ontario. Divided into two branches — the Finance Management Branch and the Securities Branch — the division is responsible for cash and investment management of ordinary and capital funds approaching \$4 billion per annum and for all the debt transactions emanating from an increasingly broad and complex character.

The management of the daily cash and the wise investment of cash flow is an all-government operation and measures are presently being considered to ensure the most rapid receipt of proceeds in all departments and agencies and to ensure that these funds are put to work in the most profitable manner. This process involves the budgeting for significant cash inflows and outflows up to a year in advance.¹

The maintenance of the Ontario Government securities market and the responsibility for all government bond issues now involves a detailed command of a great variety of conditions and circumstances in the capital markets of the world. The floating of new issues, the servicing of new debt and the management of several Crown Corporations concerned with capital aid have recently been extended by a new dimension — the entry of the Ontario Government into the European capital market.

To support this work, the division maintains continuing studies on trends in public finance and must, at the same time, maintain a continuing liaison on financial and debt matters with The Hydro-Electric Power Commission of Ontario (whose securities are all guaranteed by the Province), with other financial agencies and with those responsible for certain designated funds.

The Finance Division and the Taxation and Fiscal Policy Branch are blood brothers in the budgetary process and in the realm of public finance. To a greater degree than any other relationship in the department, "economics" and "finance" are brought into daily harmony through the interaction of the Finance Division and the Taxation and Fiscal Policy Branch. It will be interesting to observe, over time, the development of a common language among government bankers and economists.

¹The Treasurer of Ontario devoted particular attention to this matter in the Ontario Budget recently: "... the Department of Treasury and Economics is preparing

to introduce new and more sophisticated accounting practices throughout the Government to ensure an immediate flow of financial data to the Department. This should provide a

continuing profile of the current financial situation and clearer guidance for cash management and investment decisions".

GOVERNMENT ACCOUNTS DIVISION

The Government Accounts Division is the agency responsible for the development and maintenance of government-wide accounting and financial systems both for central agencies and other departments, the maintenance of overall financial records, as well as the central cashing and disbursement functions, including payments from special funds. The division is also responsible for the administration of the Government's insurance plan and pensions payable under The Public Service Superannuation Act and The Legislative Assembly Retirement Allowances Act.

As indicated in the discussion of the work of the Taxation and Fiscal Policy Branch, the key role at this time is the development of a sophisticated financial information system on a government-wide basis, a project that will be moving ahead with all possible haste. This procedure will support the continuing development, presently underway, of financial statements, public accounts, and budgetary statements in forms that will illustrate clearly the inflow and outflow of government finances and support the work of the Taxation and Fiscal Policy Branch. In this process, the Government Accounts Division will be working even more closely with all departments in developing common accounting policy and financial reporting methods.

Government Accounts Branch

The role of the Government Accounts Branch is basically twofold in character: extroverted towards the departments in respect of its advisory and accounting policy-making function, and introverted in its capacity as the central cashier, paying agent, and recording and reporting unit of the Government.

In the former role, a continuing liaison, currently being strengthened and developed, exists with the senior financial officers of the various government departments, aimed at the application of overall government policies as they relate to common accounting functions. Interpretation and advice is supplied by the branch as it relates to accounting policy and to submissions from departments seeking to initiate new methods, records, systems and reports. Through assisting in the planning, research and implementation of major projects such as program-planning-budgeting systems, financial information systems, or economic (national)

accounting conversion, the branch provides an operational bridge with the departments.

In its other capacity, the branch is, in effect, the central accounting and control point for the Government's daily business. All moneys are collected and deposited with the cashier while, as the paying agent, the branch writes cheques for the payment of all suppliers' accounts, numbering approximately 800,000 per year. Close daily contact is maintained in these areas with the Finance Division to assist in the effective management of the provincial cash position.

The central records maintained by the branch are the source of the various financial statements of the Province. These include the statements in the Public Accounts of the Province and the Abridged Report, which are distributed to members of the Legislature and throughout the financial community. From this branch, there also emanate all prospectuses relating to provincial loan issues in Canada, the United States and Europe, together with much information of a financial nature submitted to the Dominion Bureau of Statistics and to various financial institutions. Information is exchanged with and supplied to the Taxation and Fiscal Policy Branch in the preparation of the Budget Papers and to the Treasury Board Secretariat for its work on the Estimates.

The payroll for all regular and probationary staff, a complex computer-based system paying 55,000 employees every two weeks, is co-ordinated by this branch and programming improvements and refinements are continuously being developed in conjunction with the Systems and Programming Branch of the Economic and Statistical Services Division. Payroll policies are devised by the co-ordinating unit, and instruction and guidance are given to the departments.

In support of the payroll system, the Tabulating Section key-punches some 35,000 monthly changes to the computer master file from departmental input material. In addition to this task, the Tabulating Section updates all records and produces some 70,000 welfare cheques and 6,000 superannuation cheques per month, plus all cheques in payment of interest due on outstanding provincial bond issues. From time to time, other periodic productions include items such as some 75,000 student award cheques for the Department of University Affairs. In this respect, the Tabulating Section backs up the Computer Services Centre by undertaking the "intermediate" tabulating

needs of government, which are too small to warrant a computer application, but larger than can be handled by a manual or book-keeping-machine operation.

The Loan Accounting Section administers the control, accounting and collection of loans, liens, mortgages and debentures arising from various statutes, principally The Municipal and School Tax Credit Assistance Act, The Tile Drainage Act, and the Co-operative Loan Act. Other functions include the recording and collection of advances and loans made to provincial Crown Corporations and Agencies, the administration of bequests and scholarships held by the Province under certain trust deeds and of special funds arising from statutes dealing with industrial standards, minimum wage and fair wage practices.

Government Accounting Methods Branch

This new branch has been formed to play a vital role in the Government's organization for financial control. It acts in an advisory or consulting fashion in the fields of finance and accounting related to both new and existing legislation. It is equipped to supply accounting expertise for the co-ordinated studies of economists, Treasury Board officers and senior financial officers across government. Its purpose and scope are best summed up as follows:

- it is a central source of professional accountants skilled in accounting methods work;
- it has the capacity to develop (in co-operation with the Government Accounts Branch) financial information systems;
- it provides accounting systems support to all units of government upon the request of departmental financial administrators or at the direction of the Comptroller of Accounts;
- it interprets, defines and recommends accounting policy for the Department of Treasury and Economics;
- it co-operates with representatives from other specialist bodies, for example, the Advisory Services Division and the Program and Estimates Division of the Treasury Board Secretariat, by seconding its officers to joint task forces created to review problems of a government-wide nature;
- it provides an environment in which the training of government accountants and

financial advisers can take place on a broad scale;

- it conducts a continuous program of research into accounting theory and practice, pertinent to the needs of government.

The branch has, in effect, a staff function and its officers are being selected for their ability to create and to implement appropriate accounting systems in any branch of government. Their skill is derived from a professional accounting training with many years of practical application in a government or business environment. In developing these new functions, they will be not only undertaking a major responsibility but also participating in a creative venture.

Pension Funds Branch

In 1961, the Pension Funds Branch was formed in the Government Accounts Division of the Treasury Department and has since handled the administrative and accounting work under the Public Service Superannuation Act and The Legislative Assembly Retirement Allowances Act. In this process, the main functions are the following:

- opening and maintaining history and contribution data for each contributor, and ensuring that each contributor receives full credit for his continuous employment in the Ontario Public Service and for any prior pensionable service with another pension fund with whom the Government has a reciprocal transfer of pension credits arrangement;
- maintaining proper accounting records with respect to the two funds and preparing financial statements, estimates and forecasts for the funds and accumulating data required for the triennial actuarial evaluation of the Public Service Superannuation Fund;
- refunding contributions and transferring contributions to other pension funds for those who cease to be contributors by reason of resignation, dismissal or death;
- calculating and paying annuities, retirement pensions, disability pensions, dependants' pensions and lump sum payments where contributors retire, for health or other reasons, or die;
- providing policy and secretarial services to the Public Service Superannuation Board and counselling services to contributors, pensioners, senior government officials and estate representatives.

Such a broad administrative activity is also productive of a variety of aggregate data of great interest to the policy planning of the Ontario Government.

Group Insurance Section

As part of the negotiated fringe benefits for civil servants, the Government agreed to contribute part of the cost of a group life and health benefit plan. The Province of Ontario Employees' Group Insurance Plan was the result of this agreement, with the Government assuming 75 per cent of the premium for a compulsory basic life insurance policy for every eligible civil servant, and 65 per cent of the premium for an optional basic surgical-medical benefit for those employees who choose this benefit. When the agreement was brought into effect, the Government decided to centralize the administrative, central control and employee-insurance company liaison function of the Plan by creating a Group Insurance Section answering directly to the Comptroller of Accounts.

In the administration of the Plan, the Group Insurance Section is responsible for advising the underwriter of all applications, terminations and changes in insurance coverage for the more than 60,000 eligible employees. To accomplish this, all transactions affecting insurance coverage are communicated to this section by all government departments and participating boards and commissions (approximately 2,000 per month). Each transaction is scrutinized to ensure that it accords with the terms of the contract governing the Plan and that the information is correct.

All administrative circulars pertaining to procedures and interpretations of the contract are prepared and issued by this section, as are all pertinent literature and designated forms. Claims received by the underwriter for services which are not clearly defined in the contract are referred to this section for an opinion as to the manner in which the claim should be treated. Employees also look to this section for an explanation of disallowed claims.

In a word, Group Insurance, a very small section, maintains contact with a wide variety of people.

ECONOMIC AND STATISTICAL SERVICES DIVISION

In addition to the Government Accounts Division, the other great source of data — the producer of raw material for the whole

department — is the Economic and Statistical Services Division. It is composed of three branches; the Economic Analysis Branch, the Ontario Statistical Centre, and the Systems and Programming Branch. Each of these support functions is crucial to the work of other divisions and complex in its professional responsibilities. In that sense, they form the foundation stone of the whole department. As a result, major administrative attention is now being directed to the development of these branches.

Economic Analysis Branch

Whereas the qualitative aspects of economic and social life should be paramount, our appreciation and evaluation of the best means to achieve better conditions can be immeasurably assisted by the scientific method. Reflecting this increasing need for detailed quantitative analyses of major sectors of the Ontario economy, the Economic Analysis Branch was created as the "scientific arm" of our body of economists. Last year, the branch initiated a continuing econometric program designed for the formulation, estimation and testing of econometric models. In order to provide maximum flexibility in terms of application, model designs will incorporate both forecasting and policy-testing features. Considerable emphasis is placed on the development of computer simulation experiments with economic models, both for design verification and the testing of alternative policies. As the design of econometric models requires large data inputs, considerable time and effort have to be devoted to the development of new time series in cooperation with the Ontario Statistical Centre and other sections of the Economic Analysis Branch.

During the past few months, a preliminary formulation of an aggregate model for the Ontario economy was developed while major structural sectors are now in the testing stage. Dynamic features will be incorporated into the existing equation system to assess relative stability characteristics of the model.

The final version of the pilot model now under development is scheduled to be completed by mid-1970. While at present the prime target is the development of an integrated model of Ontario's economy at a fairly high level of aggregation, during the fiscal year 1970/71 considerable emphasis will be placed on the design of more detailed sectoral models for specific areas of eco-

economic activity such as manufacturing and agriculture.

Supplementing the dynamic analysis of Ontario's economy in the form of econometric models, an input-output table for the province is being developed to provide a valuable tool for the structural analysis of the sectoral interdependence of the economy. The first input-output table for the Ontario economy is scheduled for publication by mid-1970. Reflecting the currently limited availability of basic data, the size of the first table will be confined to a transaction matrix of the approximate order 60 x 60. The table is based on 1965 data and efforts are currently concentrated on extracting pertinent statistics from the Ontario Census of Manufactures (1965).

As the design of an integrated econometric model for Ontario is, to a large extent, dependent on the availability of "national account type data" for the province and the constituent ten economic regions, the branch intends to continue and to expand its work on the development of provincial and regional income and expenditure data. Reflecting existing data limitations, the research program concentrates on those account components available at national and provincial level which are susceptible to regional decomposition on the basis of corollary information sources and through application of advanced statistical and econometric techniques.

During the past few months, a time-series on consumption expenditures in Ontario has been developed to facilitate the analysis of provincial and regional differences in consumption patterns. The study represents the first step in the development of an expenditure-flow table for the design of provincial and regional accounts, supplementing previous pilot studies on regional income. (A condensed version of the study was published in the September/October 1968 issue of the *Ontario Economic Review*.) Meanwhile, work on the disaggregation of consumer expenditures by major commodity groups was initiated last September to determine group-specific income elasticities. Basic provincial accounts (of the national account type) for the period 1957-1968 are scheduled for publication at the end of 1969, while the constituent regional accounts will be developed during the fiscal year 1970-71.

The demographic section of the Economic Analysis Branch is examining, systematically, all aspects of Ontario's population structure

with a view to assessing the economic and social impact of demographic variables over time. While concentrating essentially on the Ontario scene, the section is carrying out comparative studies for the evaluation of demographic trends in other provinces, the United States and selected foreign countries. A comprehensive tabulation of preliminary population forecasts to 1991 was compiled and has already been published.¹ A mathematical model of population growth, utilizing the analytical framework of generalized Markov processes, is also being developed to improve forecasting accuracy.

The last, but by no means least, responsibility of the Economic Analysis Branch is the publication of the *Ontario Economic Review* and the provision of continuous editorial services to the whole department. Modifications of and additions to the "Economic Indicators" currently in use are under study and we expect that the work performed in other sections of the branch will provide the basis for improving the analytical and statistical content of the *Ontario Economic Review*. We welcome the dialogue which has been joined with many of our readers; we have benefited greatly from their comments and advice.

Ontario Statistical Centre

The basic function of the Ontario Statistical Centre is to engage in the efficient collection, storage and production of statistical information as required by the central research units for economic analysis and policy planning in the Department of Treasury and Economics. The Centre advises on matters concerning administration of the Ontario Statistics Act, designs samples for statistical purposes and may conduct field surveys for Ontario Government departments. It exerts a co-ordinating influence on the statistical activities of provincial departments and agencies of government and provides liaison between the Government of Ontario and the Dominion Bureau of Statistics in statistical matters. The Ontario Statistical Centre works closely with the Economic Analysis Branch in the acquisition of raw data necessary for the development of input-output tables and the construction of provincial economic accounts for improved analytical and forecasting purposes.

Another aspect of its work is concerned with applied research in the area of statistical techniques and systems. Such activities include the development of a central informa-

tion system, including a data bank facility designed to facilitate the integration of selected economic, financial and administrative data useful for research and decision-making purposes by government and the business community. The Centre aids in developing standards and systems compatible with a data bank operation and undertakes feasibility studies to determine research needs for administrative data on a selective basis. Common information stored in the central information system will be made available to government departments and industry in a form and to the extent permitted by the statutory and administrative rules of confidentiality and disclosure.

The Centre is currently engaged in compiling a nucleus of socio-economic statistics on the Ontario economy. The major source of such statistics — shortly to be computerized — is the Census of Manufactures, a survey conducted in conjunction with the Dominion Bureau of Statistics using duplicate Bureau questionnaires to compile information on the manufacturing industries of the province. The data collected pertain to inventory, fuel and electricity, raw materials and supplies, shipments, goods purchased for resale, and payroll and employment. This information is used as a statistical base for economic planning projects underway in other units of the department, at both provincial and sub-provincial levels, as well as the development studies concerning input-output analysis and related activities.

At present, the bank of socio-economic statistics is being expanded to include data from the census of forestry and other industry returns as resources permit. Statistics relating to the operation of selected industries in Ontario are being compiled and will be published periodically and, whenever possible, the publication of similar information for sub-provincial areas such as the ten economic regions, will be carried out. Census material will be supplemented from time to time by data derived from special field surveys, and it is expected that a small field or liaison force will be used in connection with all surveys, to facilitate the flow of raw data from respondents to the Centre.

In addition to the Census of Manufactures, the Centre participates in *ad hoc* surveys in order to provide data urgently needed for formulating government policy in problem areas such as pollution and waste disposal. It is currently conducting annual and quarterly surveys in co-operation with

¹Province of Ontario, Department of Treasury and Economics, Preliminary Population Projections for Ontario, 1971-1991.

the Pension Commission of Ontario, the Department of Financial and Commercial Affairs, and the Department of Municipal Affairs to provide data on credit union and pension plan operations and to assist in the development of "small area statistics". Administrative data generated by other departments are utilized by the Centre to provide information concerning retail sales, vital statistics and government expenditures.

In addition to preparing sample designs and determining the sampling technique and sample size to be used, the Centre also prepares estimates of man-power, cost and time involved in field surveys. It co-operates with branches initiating the survey in the preparation and pretesting of questionnaires. Assistance is also provided in the preparation of interviewers' manuals and in the training of field forces to ensure correct interpretation of basic concepts and methods of interview.

The Centre develops or assists in the development of common coding and classification systems for industries, commodities, occupations, or geographical areas and co-operates with other statistical bodies in developing statistical standards. It co-ordinates the use of common codes and classification in the province and provides consulting services to other departments in the classification of statistical information. The Centre is in continuing contact with computer programmers and systems analysts in order to obtain maximum use of data processing techniques.

Alert to modern techniques and methods in the statistical field, the Centre is computer-oriented with data development carried out and integrated by application of the "information systems" concept. The Ontario Statistical Centre faces an immense and demanding task in meeting an increasing need for reliable statistics in support of quantitative analysis and informed policy formulation.

Systems and Programming Branch

For more than a decade, government planners and administrators in Ontario have been using computers to save taxpayers' dollars. To realize the vast potential which this machinery offers requires the readily available services of highly skilled and competent computer systems and programming staff.

There is a great deal of truth in the aphorism: "It would take 200 mathematicians 60 years to make the same mistake that the computer can make in just 10 seconds." However, the Systems and Pro-

gramming Branch of the Department is composed primarily of computer systems analysts and computer programmers dedicated to providing other divisions of the department with easy access to computing facilities, without risking the danger of making such colossal and expensive errors.

Many people ask why the Government has invested so heavily in computing facilities. The answer, at least in part, is simple. As much as 90 per cent of all management decisions made each year probably could be defined precisely and, consequently, are possible to perform with a computer system. For example, decisions related to purchasing, allocation of materials, facilities and capital, as well as routine inventory control, can be performed by computer systems using operations research techniques. In many instances, computerized systems help to improve decision-making by reducing the expenditures of time, money and talent. As a consequence, managers are able to spend more time on those higher-level decisions which currently defy precise analysis. Even in these difficult areas, the computer can provide assistance by allowing managers to quickly and economically explore various alternative solutions to a problem through the use of simulation techniques.

The aim of the Systems and Programming Branch is, therefore, directed toward serving the management needs within the department. The branch is responsible for conducting all computer systems development and program implementation for the Government Accounts, Policy Planning, and Finance Divisions. In addition, it develops applications for the Ontario Statistical Centre and the Economic Analysis Branch. The branch also plays a key role in the implementation of the computerized central information system, embracing the data bank facility. This will provide management with ready access to extensive socio-economic information about Ontario.

Activities now underway include the development and maintenance of:

- the government-wide payroll and information report system;
- a comprehensive library of generalized computer programs for advanced techniques of statistical processing and economic analysis;
- other small scale computer system applications of both a commercial data processing and scientific nature.

The branch also offers counsel on the feasibility of employing various data-processing and mathematically oriented management techniques within the department.

Future work, currently planned, will involve participation in the implementation of computer-based systems for:

- a government-wide planning-programming-budgeting system under the direction of Treasury Board;
- general purpose, statistical utility computer routines to deal with large volumes of data, involving many interrelated variables;
- management information retrieval system to process large data files involving complex data records.

How is all this achieved? Essentially, the five major functions involved in the development and implementation of typical computer systems applications are the following:

- problem definition and specifications;
- computer systems design and development;
- scientific computer programming;
- data processing computer programming;
- computerized data file creation.

The organization of the branch has been designed to accommodate each of the above functions because each activity requires a distinctly different and highly specialized discipline for its satisfactory execution.

An interesting feature not often found in government units is the project team, or task force concept, used by the branch in carrying out all of its projects. Major projects usually involve requirements from each of the five specialist areas. The required personnel, therefore, are selected from the five areas and assigned to a project task force on a work-time percentage basis.

As phases of the project are completed, certain personnel may be phased out of the task force, while others increase their participation in the project. There is consequently no rigid or static organizational pattern associated with each project in which the branch is engaged. Ideally the project task team also includes persons assigned from the unit for which the system is being developed. This flexible organizational approach, combined with the inherent savings of automated systems, allows the department to perform its functions at a much lower cost than would be possible by any other method. Over the last ten years, computing speed has

improved a thousandfold and storage space has been reduced in cost by roughly the same factor.

The efficiency of computing is likely to continue this trend well into the 1970's, whereas the expected cost of human labour resources is likely to continue its increase. Consequently, while today's taxpayer benefits from the development of computerized systems, an even greater saving to the taxpayer of the 1970's can be anticipated. The Department of Treasury and Economics is

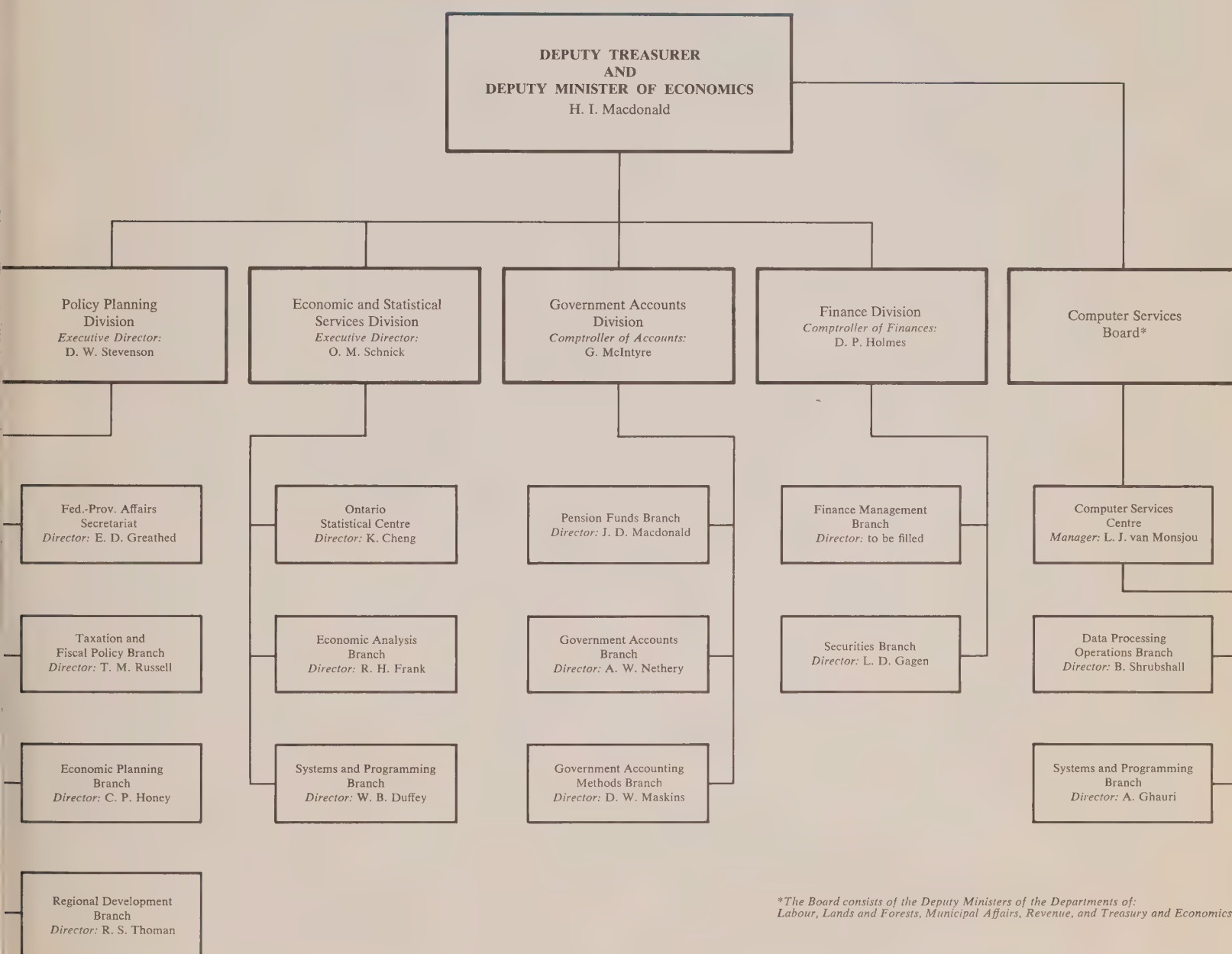
determined not only to exploit that advantage but also to ensure that its research techniques and its administrative practice are in the vanguard of technological change.

THE ROAD AHEAD

The honeymoon is over and the strenuous task of building a happy marriage has begun. Already, the household has introduced modern electronic devices in terms of access to the Computer Services Centre. Time and space do not permit a fuller description of

that Centre, whose services are so valuable and critical to the effective development of the household. The marriage of "economics" with "finance" is proving to be an exciting and stimulating one for those privileged to be involved — rich in promise and determined to succeed. The department is a response to a philosophy and has been organized to ensure a unity of purpose and function. In the fiscal year 1969/70, the four hundred members of the department will be working together to that end.

DEPARTMENT OF TREASURY AND ECONOMICS



*The Board consists of the Deputy Ministers of the Departments of: Labour, Lands and Forests, Municipal Affairs, Revenue, and Treasury and Economics.

Selected Economic Indicators

Leading Indicators

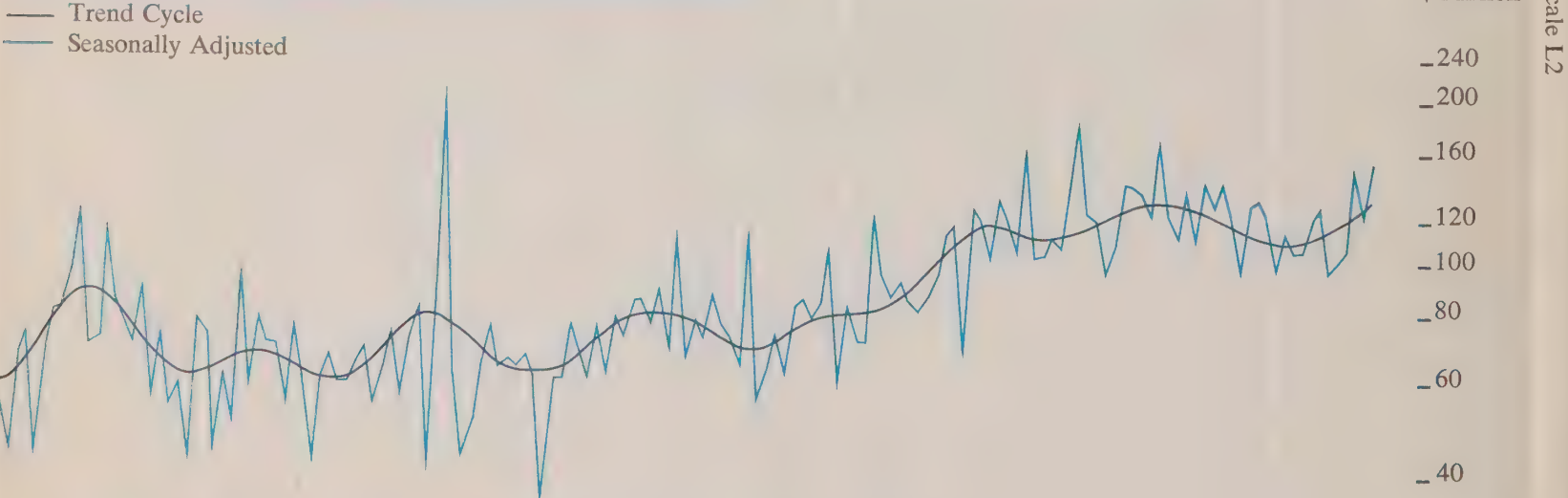
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



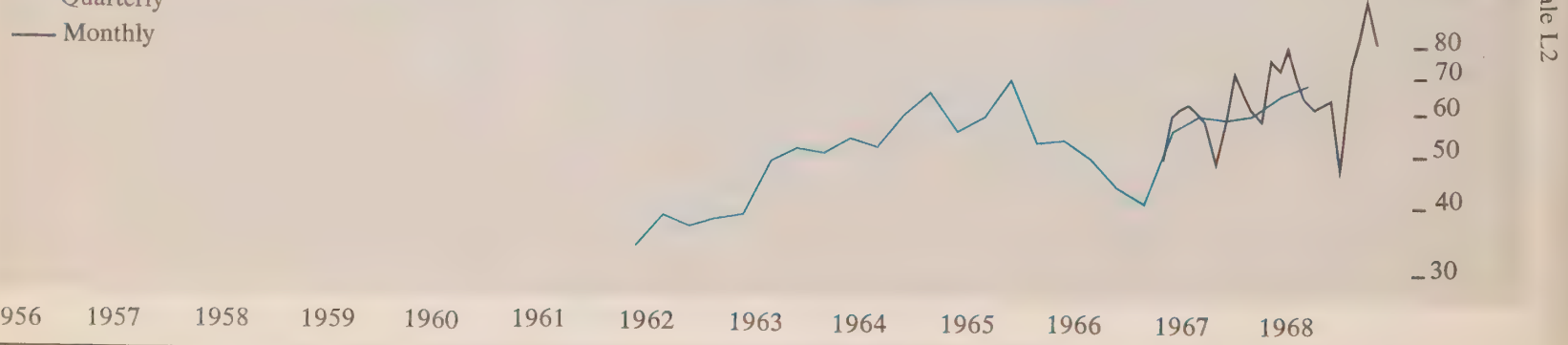
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Business, Industrial and Engineering Construction Contracts, Ontario

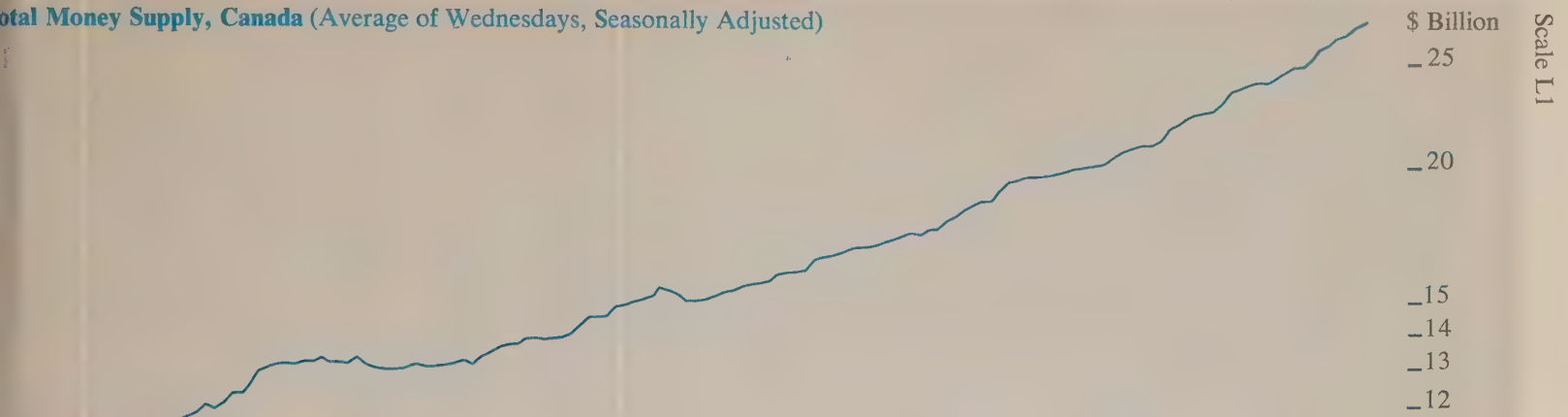


Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

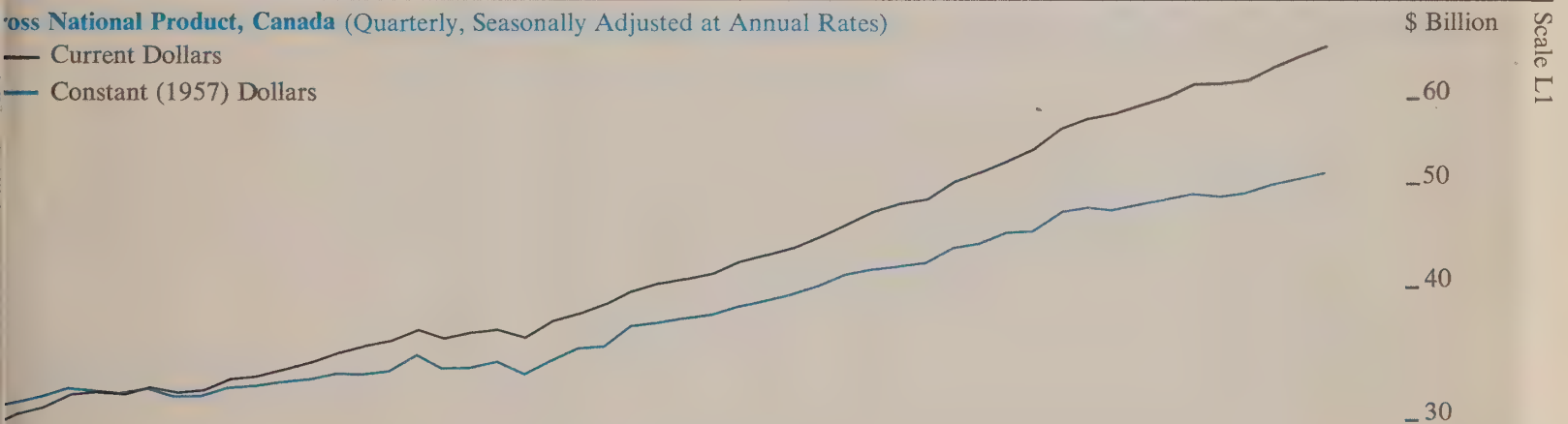


Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

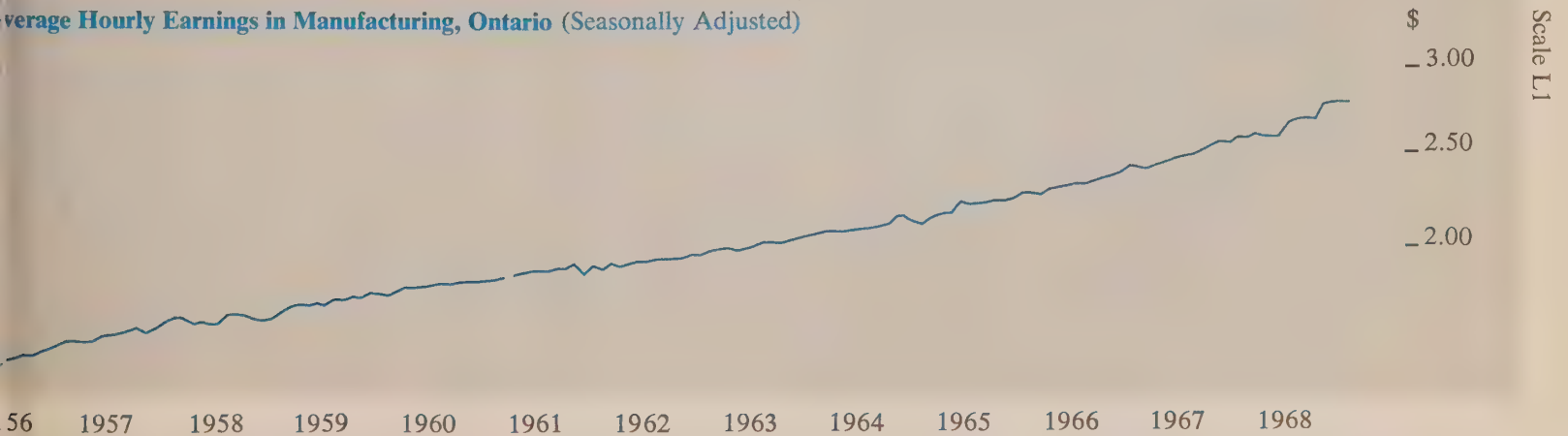


Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)



Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

%

Scale A



Employment, Ontario (Seasonally Adjusted)

Million

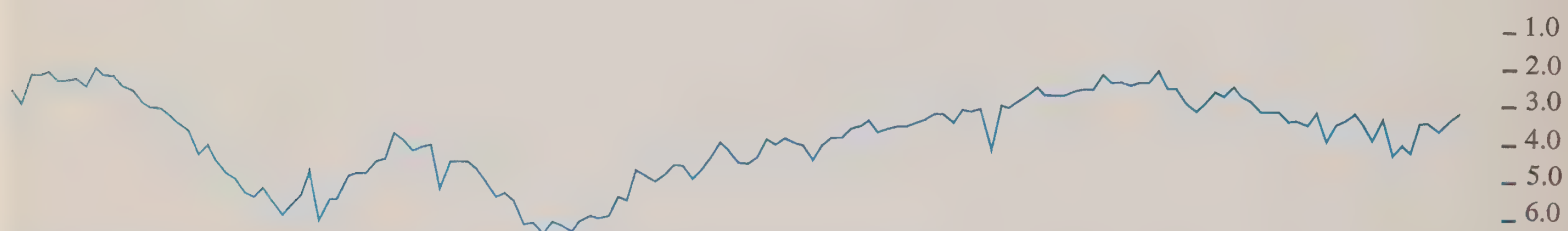
Scale L1



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of Labour Force

Scale A



Index of Motor Vehicle Production, Canada (1949 = 100, Seasonally Adjusted)

Index
1949 = 100

Scale L2



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Economic Indicators

Seasonally Adjusted

		1968												1969	
		Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Leading Indicators															
Average Weekly Hours Worked in Manufacturing	Number	39.9	40.5	39.6	40.6	40.7	40.3	40.3	40.2	40.6	40.6	40.7	40.1		
New Orders in Manufacturing Industries ^a	\$ Million	3,225	3,161	3,191	3,276	3,360	3,349	3,377	3,420	3,601	3,581	3,577	3,430	3,524	
Business, Industrial and Engineering Construction Contracts	\$ Million	105.4	111.3	104.6	107.1	123.4	129.3	97.7	101.8	107.8	154.4	125.0	155.0	115.1	
Urban Housing Starts (Annual Rate)	Number	76,300	72,200	79,400	69,200	63,200	60,800	61,900	63,900	48,900	73,400	83,500	98,200	80,800	109,700
Money Supply ^b	\$ Million	24,149	24,479	24,682	24,972	24,987	25,400	25,846	26,314	26,702	26,827	27,226	27,464	27,580	27,953
U.S. Industrial Index ^a	1956 = 100	157.43	150.24	146.88	160.43	157.87	166.61	165.93	169.02	176.37	179.61	187.29	188.93	192.47	185.20
Business Failures ^a	Number	54	59	87	52	50	46	49	28	36	46	48	34	57	
Business Failures - Liabilities ^a	\$ Million	2.6	1.8	5.6	6.4	2.8	6.6	2.9	1.3	1.5	2.1	2.5	1.2	2.9	
Coincidental and Lagging Indicators															
Gross National Product ^c (Annual Rate)	\$ Million			65,168			66,328			67,824			70,152		
Average Hourly Earnings in Manufacturing	Dollars	2.59	2.58	2.60	2.67	2.68	2.67	2.71	2.76	2.78	2.78	2.79	2.81		
3-Month Treasury Bill Rate ^{a,b}	Per Cent	6.29	6.80	6.98	6.99	6.95	6.56	6.03	5.48	5.66	5.57	5.66	6.24	6.38	
Cheques Cashied in Clearing Centres ¹	\$ Million	5,006	4,959	5,313	5,031	5,448	5,199	5,381	6,034	5,065	5,821	5,907	5,885	5,698	
Retail Trade	\$ Million	803	768	780	785	779	804	840	835	850	851	862	853	879	
Labour Force	000's	2,857	2,892	2,869	2,890	2,918	2,962	2,948	2,937	2,959	3,002	3,026	2,977	3,010	3,037
Employed	000's	2,769	2,793	2,760	2,796	2,796	2,844	2,825	2,837	2,858	2,890	2,923	2,879	2,928	2,947
Unemployed	000's	88	99	109	94	122	118	123	100	101	112	103	98	82	90
Unemployed as % of Labour Force	Per Cent	3.1	3.4	3.8	3.3	4.2	4.0	4.2	3.4	3.4	3.7	3.4	3.3	2.7	3.0
Wages and Salaries	\$ Million	1,111	1,103	1,107	1,130	1,141	1,141	1,142	1,157	1,186	1,198	1,223	1,223		
Index of Industrial Employment	1961 = 100	126.3	124.2	125.5	126.0	125.8	124.0	124.1	125.4	126.7	127.8	128.6	129.3	130.0	
Index of Industrial Production^a															
Total Manufacturing ^a	1961 = 100	153.8	153.9	154.9	156.8	158.4	160.1	159.5	159.3	161.6	162.9	165.1	166.2	164.8	166.0
Non-Durables ^a		153.0	152.2	154.0	156.4	158.1	159.7	157.8	158.0	161.3	162.5	165.2	166.0	163.3	165.4
Durables ^a		138.8	141.9	145.7	143.5	142.8	146.1	142.1	139.8	142.8	144.0	147.6	150.9	147.5	150.1
Mining ^a		170.4	164.8	164.2	172.2	176.8	176.2	177.0	180.2	183.9	184.7	186.7	184.4	182.6	184.1
Electric Power and Gas Utilities ^a		145.8	152.8	152.4	153.3	153.1	154.6	156.1	154.3	152.9	155.0	155.4	153.9	158.1	157.6
Primary Energy Demand (Annual Rate)	BKWH	55.60	55.15	54.01	53.94	53.81	53.83	55.92	55.69	54.83	57.09	57.89	59.81	59.83	
Exports (including re-exports)	\$ Million	1,077.7	1,140.4	1,125.7	1,165.3	1,097.2	1,115.9	1,068.5	1,103.5	1,115.0	1,176.4	1,203.2	1,202.4	1,215.0	1,306.0
Imports ^a	\$ Million	974.5	1,093.9	970.9	1,026.6	992.2	962.7	927.3	963.0	1,092.1	1,127.2	1,084.3	1,106.0	1,163.0	1,221.0
Unclassified Indicators															
Foreign Exchange Reserves ^a	U.S. \$ Million	2,175	2,490	2,244	2,416	2,695	2,574	2,515	2,590	2,534	2,525	2,672	2,827	2,864	2,820
Industrial Materials Price Index ^a	1935-39 = 100	253.5	252.4	253.0	251.2	252.0	253.0	253.4	254.2	253.4	256.8	257.1	258.9	261.4	264.6
Consumer Price Index ^{a,b}	1961 = 100	118.1	118.2	118.6	119.3	119.3	119.7	120.4	120.7	121.1	121.4	121.9	122.3	122.6	122.6

^aStatistics for Canada.^bNot seasonally adjusted.¹Ontario less Toronto.



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May/June 1969
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Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister



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The Ontario Economy

The Reform of Taxation and Government Structure in Ontario

Taxation and Fiscal Policy Branch
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 5, Ontario.

About the Review

The feature article for the May-June edition of the *Ontario Economic Review* presents the Provincial Government's long-term program for basic reform of taxation and government structure in Ontario. The article is based on a white paper contained in the 1969 Annual Budget Statement of the Hon. Charles MacNaughton, Treasurer of Ontario and Minister of Economics.

The primary objective of this program is to provide a more equitable and viable financial basis for the development of provincial and municipal operations in future years. Concrete steps will be taken to integrate provincial-municipal tax systems and to permit a more systematic control of the level and distribution of tax burdens. A series of measures will also be advanced to strengthen and modernize the financial and functional structure of the municipal sector of the Ontario governmental scene.

The article was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Policy Planning Division of the Department of Treasury and Economics.

Indicator Charts, Pages 10-12

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 10-12 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

In the first quarter of 1969 the economies of Ontario and Canada enjoyed a continuation of the strong performance which characterized the final months of 1968. However, accompanying this strength was the continuing problem of large price increases.

Despite a movement by the federal authorities in both Canada and the United States toward greater restraint the Canadian consumer price index rose sharply in both March and April to levels of 123.2 and 124.6 respectively. The March/April increase of .1 per cent represents the highest monthly increase since June 1956. In February, the index remained unchanged from its January level of 122.6 and in earlier months the rate of increase was well below one-half of one per cent. In July of 1968 the index rose by six-tenths of one per cent. During the past four months, the consumer price index has also shown a faster rate of year-to-year increase. April prices this year were 4.4 per cent higher than in April 1968. March prices were up 3.9 per cent, February prices up .7 per cent and January prices 3.8 per cent higher than the corresponding level in January 1968.

In Ontario, the latest monthly increases are attributable to higher sales and excise taxes on tobacco and alcohol and sharp gains in the health and personal care, food, housing and transportation components. The 3.2 per cent April increase in the health and personal care index is attributable to increased private prepaid medical care premiums and higher doctor, dentist and optometrist fees. The ten per cent sales tax charged on restaurant meals costing more than \$2.50, effective April 1, contributed to a higher than average rise in the food index. Another contributor to the increased index this year is the price of building materials which have recorded sizable gains. Lumber prices, caught by accelerated housing construction on the one hand and a supply shortage (due to adverse winter conditions in British Columbia) on the other, have risen 10 to 15 per cent over the corresponding period last year.

The strong pace of business activity in Canada and particularly Ontario is evidenced by the rapid growth of the labour force and the relatively low unemployment rates. In Canada, in the first quarter the labour force was an average of 4.2 per cent larger than it was in the same period one year earlier. Employment meanwhile, rose by 4.7 per cent with the result that the seasonally ad-

justed rate of unemployment fell from 4.9 per cent in the fourth quarter of 1968 to 4.2 per cent in March of 1969. In April the unemployment rate rose fractionally to 4.4 per cent of the labour force which could be an indication that government anti-inflationary policies are finally beginning to take effect. However, this could also be misleading. What has been happening under similar conditions in the United States is that large numbers of housewives and teenagers have been attracted into the labour force by available employment and record wages and thus have raised the jobless rate.

In Canada, between March and April, total employment rose by 158,000 to 7,629,000 and the labour force at 8,061,000 was up by 142,000 an above-average monthly increase for this time of year. Compared to a year earlier, the labour force was larger by 349,000 or 4.5 per cent and employment showed a considerable gain of 353,000 or 4.9 per cent.

In Ontario, in the first four months of 1969 the labour force was an average of 5.1 per cent larger than one year earlier. Employment during this period rose on average by 5.7 per cent and the unemployment rate dropped from an average seasonally adjusted level of 3.4 per cent for the four-month period in 1968 to a level of 2.8 per cent for the corresponding period in 1969.

The continued high level of housing starts in the province suggests that, barring prolonged strikes, employment in this sector of the construction industry will be well sustained throughout the first half of 1969. Ontario urban housing starts during March totalled 4,769 units, compared with 4,635 units in the preceding month and up 41 per cent from the March 1968 level of 3,384 according to recent data released by Central Mortgage and Housing Corporation.

At the close of 1968 it was expected that housing starts would begin to fall off, since the bulk of funds made available in the fall had already been used up in the immediately following period of accelerated construction activity. But this has not been the case. Canada's average seasonally adjusted housing starts reached an annual rate of 275,000 units in the first quarter of 1969 compared to a high of 231,100 units in the preceding quarter. Cumulative 1969 starts in Ontario for the first quarter rose to 13,587 units, up 56 per cent from the 1968 period. CMHC reports that multiple units accounted for all

but 20 per cent of the March urban starts which represent an annual rate of 102,400 units compared with a rate of 78,200 in March of 1968. Final figures for January and February show an increase in total Ontario urban starts to 8,818 units from 5,325 in the 1968 period.

Toronto starts were ahead 1,630 units, but the percentage of Ontario housing starts accounted for by Toronto in the first three months of 1969 dropped to 50 per cent from 56 per cent in 1968. Windsor, Ottawa, Kitchener, Kingston, Oshawa, Sudbury and Guelph had increases of more than 100 per cent in housing starts for the first three months. Declines in starts were recorded for London, Brampton, Georgetown and Chatham for the January to March period.

While expansion has been strong on many fronts, it has been particularly so in merchandise exports. It can safely be said that the continued outstanding growth of merchandise exports is due to the persistent strength of U.S. demand. Operating at a high level of capacity, with unemployment rates the lowest in years, the buoyancy of U.S. demand for consumer goods has significantly contributed to lifting total Canadian exports to \$3,463.7 million in the first quarter, 15.1 per cent above the first quarter of 1968. While exports to the United Kingdom declined by 4.7 per cent to \$282.8 million those to other Commonwealth and preferential countries rose slightly to \$135.1 million. By far the largest growth in sales was accounted for by purchases from the United States which rose by \$422.4 million to \$2,477.2 million.

Imports in the first three months increased by 16.2 per cent to \$3,265.5 million from \$2,810.0 million in the corresponding period in 1968. Purchases from the United Kingdom rose by 9.2 per cent to \$173.5 million, and from other Commonwealth and preferential countries by 21.3 per cent to \$94.0 million. Imports from the United States rose by 16.6 per cent to \$2,487.5 million and from other countries by 15.8 per cent to \$510.5 million.

Preliminary data on Canadian Trade for the month of April indicate a substantial reduction in the growth of exports. Total exports for April rose by only 1.5 per cent to \$1,196.2 million from \$1,178.1 million in April of 1968. This is in sharp contrast to the 19.4 per cent year-to-year increase in March. Moreover, April exports to the U.S. increased by only 7.0 per cent on a year-to-year basis as opposed to the 24.5 per

cent March 1968 to March 1969 increase. Exports to the U.K. fell by 13.1 per cent and those to other Commonwealth and preferential countries decreased by 15.2 per cent.

Imports in April continued to advance strongly gaining 14.4 per cent, or more than \$155 million to \$1,246.7 million. The largest increase remained in trade with the United States, where imports rose by 15.4 per cent to \$912.2 million from \$791.8 million in April 1968. Imports from the U.K. decreased by 6.2 per cent and increased by 11.4 per cent from other Commonwealth and preferential countries.

Another strong performer in the first quarter of 1969 has been the Canadian steel industry. Production has been running at an unexpectedly high level causing industry forecasters to revise upward their estimates of output for the year — assuming that strikes are not encountered. Until recently, the standard forecast was that ingot production would fall 300,000 to 500,000 tons below the record 11.1 million tons poured in 1968, when U.S. consumers were buying heavily in anticipation of a steel strike. However, in the first three months of 1969 Canadian mills have turned out 2,903,000 tons of steel ingots, seven per cent above the high 1968 level. Steel officials have also indicated that orders in hand and commitments being made should maintain production levels through the second and third quarters of the year.

While much of the early advance may be attributable to anticipated steel industry strikes early this summer consumption has also increased with preliminary construction figures now suggesting that the total value of new contracts awarded in the first quarter rose by more than 25 per cent from the similar 1968 period. This represents a considerable increase from the cautious eight per cent twelve-month expansion forecast for 1969. It is obvious that this first-quarter increase will not be maintained throughout the year, however, it would seem to indicate that construction users are anxious to have labour and materials committed to their projects in anticipation that supplies might be tight later in the year. It could also be said to reflect the strong push generated by the forecast nine per cent growth in private and public investment in 1969.

The 1969 investment program as summarized in the recently released official

estimates¹ forecasts an increase of \$1.4 billion in private and public capital spending. The annual survey covers business establishments, institutions, all levels of government and housing and is designed to provide an indication of investment intentions on the whole, during the current period of economic activity. In the past the survey has tended to understate the magnitude of the actual advance in investment expenditures. However, there are indications in the existing economic climate which suggest that this year the reverse may be true.

The capital program planned for 1969 represents an advance of 8.7 per cent over the expenditure program of \$15.7 billion in 1968 and sharply contrasts with the slowing down in investment in 1967 and 1968 when total capital outlays rose by only approximately two per cent per annum. However, the forecast increase does not rival the high rate of growth achieved in the 1962-66 period. In the early 1960's, when vigorous efforts were being made to build a stock of plant and equipment as the economy moved to more fully utilize its resources, capital spending rose very rapidly averaging 15 per cent annually. While the rate of gain indicated for 1969 is more moderate than that of 1962-1966 it does appear that investment spending may now be rising more in line with the growth that can be anticipated for the economy as a whole.

Increases in capital spending are planned in almost all major sectors of the Canadian economy in 1969. Plans of business involve a rise of almost eight per cent in outlays over those of 1968. Social capital spending by institutions and government departments is also expected to increase by nearly eight per cent, while outlays for housing are likely to be more than twelve per cent greater than those of the previous year. This is a slower rate of growth than last year, when housing outlays totalled \$2.88 billion or 21 per cent more than 1967. The most important change from trends in recent years is in the business sector, where the increase of eight per cent now planned follows two consecutive years of decline in business investment. The gains expected in social capital spending are little different from those which occurred in 1968.

The sharpest reversals in trend in 1969 within the business sector occur in the commodity producing industries and in the trade

and commerce sectors. Outlays by the commodity producing industries are expected to increase by slightly more than seven per cent in 1969 compared with a drop in spending of eight per cent in 1968. Capital spending by manufacturers is expected to increase by almost 15 per cent after a decline of almost 13 per cent last year. The most substantial increases here are expected to occur in the primary metals, transportation equipment and petroleum refining industries.

The report indicates that capital spending plans will increase in every major economic region of the country. The greatest increase will occur in Ontario, where spending will rise an estimated 15.5 per cent to \$6,379.2 million. The next highest intention being an 11-per-cent increase in the Atlantic Provinces.

Total manufacturing activity in Ontario is estimated to increase by 31.6 per cent from the preliminary actual level of \$1,000.5 million in 1968 to \$1,316.8 million in 1969. Business activity will increase by almost 25 per cent, utilities by 17 per cent and housing by an estimated 15 per cent whereas institutional services and government departments have indicated a low 3.4 per cent increase in capital spending in 1969.

The survey of intentions reflected by the official report was of course compiled around the beginning of the new year. It seemed reasonable at that time, and indeed still seems reasonable to expect that with continued steady growth in both domestic demand and export markets an expansion of the magnitude outlined above would be in order. At that time, too, there was widespread hope that the forces of inflation, both in Canada and the United States were gradually being brought under control.

However, the anticipated signs of cooling have been slow to appear and in response to the continued strong expansion monetary policy both here and in the United States has become more restrictive. It would therefore seem that any necessary financing for expansion not already arranged will have to be sought in a considerably different climate than originally envisioned. This will undoubtedly result in the postponement of some programs and perhaps only the partial completion of others resulting in a somewhat lower level of capital expansion than originally intended.

¹DBS and Department of Trade and Commerce, Ottawa, Private and Public Investment in Canada, Outlook 1969.

The Reform of Taxation and Government Structure in Ontario

Taxation and Fiscal Policy Branch
Department of Treasury and Economics

INTRODUCTION

The Government of Ontario is convinced that fundamental fiscal and structural reforms are necessary and urgent in this province. Both the Ontario Committee on Taxation and the Select Committee on Taxation proposed extensive reforms.¹ After examining the reports of these committees and studying thoroughly their recommendations, the Government presented its own views in a White Paper. In brief, this article describes the Government's reform objectives and its long-run plan for achieving those objectives as set out in the White Paper. The plan calls for complementary and concurrent reforms on four fronts: reform of the provincial tax system, reform of provincial aid to local governments, reform of local taxation, and reform of local government structure.

REFORM OF THE PROVINCIAL TAX SYSTEM

The Government of Ontario is planning a major redesign and reform of the provincial tax system. This is necessary because the present system is demonstrably deficient in terms of its equity, efficiency, and capacity to raise necessary provincial funds in the years ahead. The program of provincial tax reform will seek to achieve three broad objectives:

- to establish a fairer, more balanced and more revenue-productive system of provincial taxation;
- to connect, in a coordinated manner, the provincial and municipal tax systems to allow control over the level and distribution of overall tax burdens;
- to harmonize and rationalize provincial and federal taxation in Ontario to the maximum extent possible.

The reform plan, as set out, calls for extensive changes in existing provincial taxes. Some of these changes have already been implemented in the 1969 budget; others will be brought into effect over a number of years. The plan also suggests trade-offs between the Province and Ottawa in the shared-tax fields. Realization of the intended realignments in the shared-tax fields will depend, of course, on positive reception and reaction by the federal government. The key element in the reform plan, however, is the establishment of a personal income tax system for Ontario. This fundamental departure from the present character of provincial taxation is the core around which Ontario's new tax system will be developed.

A Provincial Income Tax

The Ontario Government intends to establish its own personal income tax system within the next two years. This move to an independent income tax is necessary to preserve the Province's fiscal integrity and to achieve meaningful tax reform in Ontario.

Three developments have led to this decision: the Province's need for greater access to fast-growing revenue sources in order to maintain its existing programs and undertake essential reforms; the impasse in federal-provincial tax sharing; and the inadequacy of the present income tax abatement system to serve Ontario's long-run finance and reform objectives. The first two of these factors have been extensively studied and debated since 1966. Federal-provincial studies and the Province's own projections provide ample documentation that Ontario needs additional tax room in the personal income tax field merely to carry on its existing programs and existing level of support to municipalities. Ontario's responsibility to carry forward provincial programs on the scale required and to increase municipal support magnifies this need for growth tax revenues. Similarly, the Federal Government's adamant refusal to contemplate a more realistic sharing of income tax revenues is now an accepted platitude. The third consideration, however, warrants more detailed explanation.

Public discussion has often appeared to suggest that the people of Ontario do not presently pay provincial income tax. In fact, the people of Ontario have been paying a provincial income tax for many years. The present provincial income tax is equal to 28 per cent of the federal basic tax, and is collected by Ottawa and returned to the Province. Moreover, if the Federal Government were willing to accept our offer whereby the Province would assume complete responsibility for certain shared-cost programs in exchange for an additional 20 points of personal income tax, the two governments would have virtually equal occupancy of this field. In any event, under the present income tax abatement system, Ontario is severely limited in terms of the revenues it can realistically derive from the fast-growing and progressive personal income tax field. In the first place, the Federal Government has effectively preempted any significantly increased provincial effort by its own heavy use of this field in recent years. Secondly, the collection agreements which govern this shared-tax field restrict the provinces to across-the-board rate

increases when they want to increase income tax revenues. The Federal Government, meanwhile, reserves to itself all the scope for raising revenues through changes in the tax base and in the progressive rate structure. At a time when overall income tax rates are already very high, these latter avenues surely are superior to further across-the-board rate increases.

The present system also denies the Province any role in determining the structure and method of income taxation appropriate for Ontario. In this Government's view, the present system is grossly deficient in terms of equity and simplicity. The recent imposition of the retrograde Social Development Tax has seriously compounded these defects. Judging by the Federal Government's unilateral approach to tax reform, there is no assurance, moreover, that Ontario will have any more of a voice in the upcoming reform of this vital tax area. The present income tax system, therefore, is clearly not working in Ontario's interests, either present or future.

The new personal income tax system, which the Government plans to establish, will have the following features:

- it will aim for greater simplicity and greater progressivity than the present system;
- it will be structured to produce significantly increased revenues and thereby improve the growth potential and the progressivity of Ontario's overall tax mix;
- it will be designed as an integrated personal income tax-tax credit system which coordinates provincial and municipal taxes and allows control over the level and distribution of overall tax burdens;
- it will be both a collection and a payments mechanism, which could eventually be adapted to replace income maintenance programs.

Integration will be achieved through provisions for the deduction of taxes paid by individuals in other provincial and municipal fields from their tax liability under the provincial personal income tax. For example, it will be possible to replace the present Basic Shelter Tax Exemption payments by property tax credits. Such an arrangement would be superior to the present practice in two respects. First, it would channel property tax relief directly back to all taxpayers — homeowners and tenants. Second, the tax credit system offers more scope for redistributing property tax burdens. For example, the property tax credits could be designed to vary

¹See Report of the Ontario Committee on Taxation (Toronto: Queen's Printer, 1967) commonly referred to as the Smith Committee and The Report of the Select Committee of the

Legislature on the Report of the Ontario Committee on Taxation (Toronto: Government of Ontario, 1968), commonly referred to as the Select Committee.

with income and family size or could have an upper income cut-off point. Eventually, this form of integration could be extended to incorporate tax credits against payments of retail sales taxes, health insurance premiums, and other provincial taxes which are regressive in impact. An essential adjunct of this integrated personal income tax-tax credit system would be a rebate mechanism to pay refunds to those taxpayers whose total credits exceed their total personal income tax liability. Such a procedure would represent a move toward a positive income supplement or guaranteed income scheme.

To sum up on the personal income tax, Ontario has decided to establish its own system of personal income taxation rather than continuing with the present abatement system. This course of action will allow the Province to raise necessary provincial funds on a fair and efficient basis. It will open up new scope for the systematic integration of overall provincial-municipal taxation in Ontario and lessen the burden of property taxes on those least able to pay. Whether the Federal Government is willing to continue co-operation in collection under this new system will be a matter for negotiation. Obviously, a single collection agency for both levels of government would be desirable. Recent events in Ottawa suggest that the Department of National Revenue may be replaced by a tax-collection commission. We would suggest that consideration be given to establishing a federal-provincial tax collection commission, as a joint body to serve both levels of government. On the other hand, the absence of such cooperation certainly will not inhibit the implementation of a new income tax system in Ontario.

Taxation of Capital Gains

The Ontario Government intends to tax capital gains when it introduces its provincial income tax. The Government believes that capital gains must be brought into the tax system in order to achieve greater equity between taxpayers with equal incomes and among taxpayers at different income levels. It is recognized that taxation of capital gains could reduce private savings and economic growth in Ontario. However, this potential economic disadvantage is far outweighed by the positive improvement in equity and consistency to be gained by taxing capital gains.

It is Ontario's view that capital gains should be taxed on a uniform basis all across Canada. This requires either a fully inte-

grated system of provincial capital gains taxes, a system of federal and provincial capital gains taxes or a purely federal tax, the revenue of which is shared with the provinces. Ontario is prepared to discuss these options with the Federal Government and the other provinces to ensure that a harmonized overall system is developed. If the Federal Government is not prepared to tax capital gains (either in concert with the provinces or on behalf of the provinces as well as in its own right), Ontario, nevertheless, intends to go ahead in this field. In this eventuality, Ontario's rates would have to be nominal, at least until such time as other provinces entered the field.

Ontario believes that the United States capital gains tax provides a reasonable model for designing a capital gains tax appropriate to Ontario and to Canada. Thus, the kind of tax that is envisaged would have the following features:

- taxation of gains when they are realized and upon death or emigration;
- deductibility of losses as an offset against capital gains income;
- no discounting of gains to allow for inflationary effects;
- exemption of gains on homes and other specific forms of real property, up to a lifetime limit, with periodic reassessment of this limit;
- distinction between short-run speculative gains and long-run investment gains;
- concessionary rates of tax on long-run gains and, certainly, rates that are no higher than in the United States;
- fair averaging provisions, both forward and backward.

A capital gains tax structured along these lines would minimize adverse economic effects and be administratively workable, while at the same time increasing government revenues and making the overall tax system more equitable.

Succession Duties

The new federal Estate Tax Act limits the range for modification and reform in Ontario's succession duties. Ontario strongly believes that these two taxes should remain as compatible and as harmonized as possible. If the Province were to go its own way in developing the death tax field, as Ottawa has done, the end result could be confiscatory total tax levels, capricious overall tax consequences and a disproportionate allocation of private resources devoted to compliance and

evasion. The responsible options left open to Ontario in respect of succession duties, therefore, narrow down to two: retain the provincial tax and bring it into conformity with the new federal tax, or relinquish this tax field to the federal government in exchange for equivalent revenue. Ontario proposes to relinquish its succession duties in exchange for 75 per cent of the revenues that will accrue in Ontario from full application of the new federal Estate Tax Act.

As capital gains taxation becomes fully mature in the years ahead, undue accumulations of wealth will be moderated. In Ontario's view, therefore, the need for taxation of estates will diminish and such taxation should be gradually eliminated. This could be achieved by the Federal Government, through increases in its level of exemptions, or by the provinces through forgiveness or refund of their shares of estate tax revenues.

Taxation of Gifts

With a provincial income tax, it would be feasible for Ontario to establish a provincial gift tax. There is little rationale for such a gift tax, however, once the Province moves out of the succession duties field. Moreover, a provincial gift tax on top of the new federal gift tax would push rates to punitive levels. Ontario, therefore, does not intend to establish its own gift tax.

The Province strongly contends, however, that gift tax revenues should be shared with the provinces. Since the Federal Government views gifts primarily as reductions in the size of estates eligible for estate taxes, then it is only fair that the provinces share in gift tax revenues to the same extent that they share in estate tax revenues, which is 75 per cent. Again, integration and harmonization to avoid duplication and excessive taxation is the desirable goal.

Corporation Income Tax

Ontario's corporation income tax closely parallels Canada's corporation income tax in terms of structure and design. The Province believes that this conformity must be maintained in future, both for reasons of neutrality and simplicity.

On the side of administration and collection, the Province is considering a major change. The Carter Commission, Smith Committee and Select Committee all recommended that administration and collection of the corporation income tax be turned over to the Federal Government. This Govern-

ment is persuaded by the obvious merits of such a step. There is no question that administration and collection of corporation income taxes would be more efficient and certain if handled only by a central authority. Personnel from both the provincial corporation tax and succession duties areas would become available to launch the new provincial income tax administration. Before reaching any final decision to turn over corporation income tax collection to the Federal Government, however, Ontario must be assured that the interests of corporate taxpayers as well as its own interests, and particularly its revenues, will not suffer.

The sales tax on production machinery and the higher capital taxes announced in the 1969 budget will raise Ontario's overall level of taxation on corporations substantially. This increased burden was necessary because the business sector, like all other taxpayers, must carry its fair share of revenue-raising measures. Looking to the future, however, it is apparent that there is little remaining tolerance for further increases in corporate taxation, except perhaps in corporation income tax rates. It must also be recognized that Ontario's rates cannot move far out of line with those in other jurisdictions, both in Canada and abroad, if the province is to remain competitive. Moreover, various studies have supported the contention that such increases are ultimately reflected in the price paid by consumers for goods and services.

Mining Taxation

The Government believes that the mining industry has been taxed too lightly in relation to the taxes borne by other industries and sectors of the Ontario economy. The increase in mining tax announced in the 1969 budget aims to correct this defect and to secure for all the people of Ontario the revenues which should logically accrue to them from this province's natural resources.

In addition to establishing a proper level of provincial taxation on mines, the plan for reform in this field calls for municipal taxation of mining properties. Beginning in 1970, mining municipalities will be empowered to levy property tax on smelters and other processing facilities. Assessment of these processing facilities is now under way and scheduled for completion before the end of 1969. When fully in effect, this change will add over \$10 million a year to the revenues of mining municipalities. Ultimately, many municipalities in the north will share in this additional

fiscal capacity through the formation of regional school boards and regional governments. In the meantime, the Province will continue to make payments to mining municipalities out of its general revenue, though at a reduced level and through a revised formula which includes mining workers engaged in extraction operations only. This new approach to mining taxation will result in net benefits to mining municipalities and in broad benefits to Ontario taxpayers in general.

Retail Sales Tax

Ontario's long-run financial needs dictate that the retail sales tax remain a major and growing source of revenue for the Province. Both the Smith Committee and the Select Committee recognized this inescapable reality. The thrust of reform in the sales tax area, therefore, must be to ensure that this additional revenue is raised in the most efficient and equitable manner.

Additional revenue from the retail sales tax can only be obtained by broadening the base and/or raising the rate. In this budget, the retail sales tax base was expanded to include three previously exempt areas: production machinery, hotel and motel accommodation, and movie tape and video tape rentals. This leaves little scope for further expansion of the base except in the area of services and necessities such as food. The Province does not intend to tax food, children's clothing and other necessities, at least until the regressive aspects of such taxation can be deliberately offset by tax credits and refunds under the provincial income tax. Nor does the Province envisage any great expansion in the area of services. The costs of proper administration and collection of the retail sales tax on many services would be high because of the number of vendors involved, while the additional revenues to be gained would be modest. To the extent that Ontario finds it necessary and desirable to derive additional revenue from sales taxation, therefore, it must come primarily through rate increases.

In the recent budget the retail sales tax rate on liquor, bottled beer and wine, and meals over \$2.50 has been increased to 10 per cent and taxation under The Hospitals Tax Act will be incorporated into The Retail Sales Tax Act. This represents a start in the direction of differential sales tax rates for selected commodities. The Province will continue to explore and develop this avenue before contemplating any general rate increase.

Other Provincial Taxes

The 1969 Budget has introduced significant changes in other areas of provincial taxation. The tax on tobacco has been increased, gasoline tax refunds narrowed, and numerous minor changes made to remove nuisance features, reduce collection costs and streamline administration. In the years ahead, Ontario will continue to review and improve its tax policies in these and other provincial fields.

REFORM OF PROVINCIAL AID TO LOCAL GOVERNMENTS

The Ontario Government recognizes that the local tax base carries too much of the financing burden for the provincial-municipal sector as a whole. This undue reliance on property taxation is clearly indicated by the continuing financial squeeze on municipalities and the increasing demands for provincial relief. In 1968 the Province undertook two major relief measures suggested by the Smith Committee, the Basic Shelter Tax Exemption payments and the takeover of the administration of justice, shifting approximately \$150 million of financing from the local tax base to the provincial tax base. These measures have relieved the pressure on mill rates but do not constitute adequate long-run support. A major reform objective of the Province, therefore, is to increase its financial support for local governments in order to reduce the burden of financing which falls upon the slow-growing and oppressive property tax.

Increased Provincial Grants for Education

As a first step, Ontario intends to raise its average level of support for elementary and secondary education to 60 per cent over a three-year period, beginning in 1970-71. Presently, the Province's legislative grants provide about 45 per cent of school board finances. This increase in provincial support of education from 45 to 60 per cent will represent a permanent shift in financing from the local tax base to the provincial tax base. The cost of this shift is estimated to run from \$175 million to \$250 million annually, by the end of the phase-in period.

The primary purpose of the Province in assuming this increased share of education financing is to permit some compensating reduction in school board levies. In other words, the increase in provincial taxation for school support is expected to be offset substantially by reduced local taxation for school financing. To realize this desirable reduction in local levies, it is imperative that the higher

provincial grants be accompanied by restraint in school board spending. In the past, increased provincial grants have been translated almost entirely into higher total expenditures on schools. This need not be the end result in future, however, because enrolments will level off over the next few years. If school boards do not exercise voluntary restraint in spending, this Government will consider establishing machinery, such as a budget review board, to ensure that increased financial aid from the Province is passed on to the local taxpayer.

With increased provincial support of school board costs, there is the concomitant requirement of allocating the aggregate grant among the various school boards. Under present arrangements this is handled by the Ontario Foundation Tax Plan formula. This formula will have to be revised in order to generate and distribute the higher level of provincial grants among the new school board units which were established this year.

Other Grants to Local Governments

The long-run goal of the Province is to assume a larger share of the financing for other local services as well. This cannot be achieved immediately because the Province simply does not have the financial resources to make increased transfers. As the new provincial tax system begins to produce additional revenues, however, some of these revenues will be transferred to local governments in the form of increased grants and payments. Again, if the end result is simply increased local spending, this will necessitate central review and control measures.

The Government is undertaking a comprehensive review of its grants and aid policies. As the Smith Committee pointed out, some grants are obsolete and others deserve new emphasis, while in aggregate the present system lacks coordination. The Province hopes to correct these imperfections and to develop a rationalized overall support policy. Two changes already mentioned are examples of the kind of improvements that will be sought. The Basic Shelter Tax Exemption payments will be replaced by some form of tax credits and refunds under the provincial personal income tax, and mining revenue payments will be reduced as some mining municipalities begin to collect their own revenues from mines. In redesigning its grants policies the Province also will seek to provide more of its total support in the form of unconditional grants, thereby allowing

local governments greater autonomy in their budgetary allocations.

Reform of the provincial grants system must inevitably be a long-run process. This is particularly so when the Province is working towards fundamental reforms in other related areas such as property assessment and regional government. The regional government program will simplify and assist the reform of provincial grants in two main ways. First, it will reduce the number of grant-receiving units. Second, the equalization which will occur within regions will reduce the need for equalization components in particular provincial grants. Assessment reform will also have a major bearing on the development of an improved grants system. At present the Ontario Government pays out to local governments approximately \$1 billion in grants which in one way or another are based on local assessment figures. Uniform and accurate assessment is vital, therefore, for an equitable distribution of these grants among local governments. Given these interrelationships, some time will be required before a fully adequate and coordinated grants policy can be formulated.

REFORM OF LOCAL TAXATION

Property taxation in Ontario stands in need of fundamental reform, perhaps more so than any other area. As the Smith Committee and the Select Committee so clearly pointed out, the present property tax is grossly unfair and inefficient. The proposed provincial actions to reduce the burden of financing that falls on the property tax and to offset its regressivity via personal income tax credits will substantially ameliorate these shortcomings. But reform of property taxation is still necessary and desirable, both in its own right and in order to facilitate and complement reforms in government structure and provincial grants. Therefore, the Government is determined to overhaul the entire system of property taxation and make it as equitable and efficient as possible.

There are four main policies to the Province's plan for reform:

- reassessing all real property at current value;
- broadening of the local tax base by removing exemptions;
- achieving a more neutral business assessment rate; and
- determining an appropriate distribution of tax burdens among classes of real property.

Of these, reform of assessment is the most crucial for it is the foundation upon which subsequent reforms in these other areas must be based.

Province-Wide Reassessment at Current Value

Current property assessment in Ontario is riddled with inconsistencies and inequities. Many properties are underassessed, some are overassessed and some are not assessed at all. Like properties are assessed at different values both within the same municipality and between municipalities. Moreover, there is no consistency among municipalities in the assessment treatment of particular classes of property. A class of property which enjoys low assessment and therefore a tax advantage relative to other properties in one municipality may be at a relative disadvantage in another municipality. The Ontario Government is convinced that the only way to remove these anomalies and inequities is to reassess all properties in Ontario at current value. It is the Province's aim to bring about uniformity of assessment all across Ontario in order to achieve equity among property owners, among property categories and among municipalities.

To remedy the serious existing problems in assessment, the Smith Committee recommended that Ontario provide more aid and incentives to the municipalities to improve their assessment practices. The Government has doubts that this approach would succeed without a complete change in management practices. It also believes that province-wide re-assessment can be achieved much sooner under provincial management than under local administration. Therefore, the Ontario Government has decided to assume full responsibility for the administration of property assessment. This will be done in two stages. On July 1 of this year, the Province will take over the assessment function in Northern Ontario with the exception of the districts of Kenora, Rainy River and Sudbury and the cities of Sault Ste. Marie and Fort William. On January 1, 1970 the remainder of the province will come under provincial jurisdiction.

This changeover will mean the absorption of present municipal assessment personnel by the Department of Municipal Affairs and assumption of present assessment costs by the Province. This will represent a saving to municipalities of approximately \$15 million, allowing a corresponding reduction in pro-

vincial grants. Following this immediate step, the Province intends to devote increased resources to the assessment function in order to ensure that the administration and quality of assessment is brought up to a proper level by the end of 1975.

Apart from the equity and efficiency considerations, this assessment reform will produce one major benefit to local governments themselves. Proper and systematic assessment will bring onto the rolls many properties that at present are not assessed at all or assessed on only part of their value. This will increase the revenues of the municipal sector and broaden the tax base against which future levies can be raised.

As the process of reassessment proceeds, the Province will consider the need for measures to cushion its impact. Present practices vary so widely that the move to a modern and equitable base is bound to involve financial hardships in some instances. While such hardships must eventually be borne if equity is to be achieved, temporary cushioning would smooth and ease these painful adjustments.

Broadening the Local Tax Base

The Government recognizes the desirability of broadening the property tax base by removing present exemptions and partial exemptions. Reform along these lines would have three very beneficial impacts on local finance. First, it would increase the revenue-raising capacity of the local government sector as a whole. Second, it would reduce intermunicipal fiscal disparities. Removal of exemptions would increase the assessment base of municipalities which presently have a high proportion of tax-exempt properties much more than it would for municipalities with a low proportion of tax-exempt properties. Third, it would shift some of the tax burden within each municipality from presently taxable to presently exempt properties.

The major classes of property that are presently exempt or partially exempt are private properties such as churches and YMCA's, institutional properties such as universities and hospitals, and government properties at the municipal, provincial and federal levels. The Province has already announced that it does not intend to remove the exemption for churches. The status of other private properties is currently under review. As for the other categories of exempt

properties, the Province believes it would be premature to eliminate exemptions before proper assessment of these properties has been undertaken all across the province.

In the long run, this Government hopes to be able to pay full local taxes on all the properties of the Province, its agencies and the institutions it supports. The Province's recent move to pay full grants in lieu of taxes on senior citizen housing units represents a modest start in this direction. However, full realization of this objective will not be feasible until revenues become available to finance such reform. This delay, moreover, will permit the Province to consider any relevant findings by the federal-provincial Subcommittee on Intergovernmental Taxation.

A More Neutral Business Tax

At present, commercial and industrial properties pay a supplementary business tax as well as a realty tax on their assessed value. This business tax applies different rates of business assessment (that is, different proportions of taxable assessment to total assessment) against different kinds of business; hence, it penalizes some businesses and favours others. As well, the present schedule of rates is replete with categories and definitions which may have been relevant fifty years ago but are totally obsolete and inappropriate today. The Government of Ontario believes that this discriminatory feature of local taxation should be removed. A major reform objective of the Province, therefore, is to establish a more neutral business tax on all commercial and industrial property.

This long-run goal cannot be achieved until all properties, residential as well as commercial-industrial, have been reassessed at current value. Only then will the Province be in a position to measure and evaluate the impact of business assessment rates on different businesses, on different municipalities and on municipal revenues in aggregate. As an interim measure, however, the Province is considering a reduction in the present number of business assessment rates, a narrowing in the present range of rates and a general modernization of the business tax legislation. A transitional reform along these lines would maintain an adequate business tax base during the reassessment period and, at the same time, reduce discrimination between different kinds of business.

Distribution of Property Tax Burdens

The local tax reforms already mentioned will work to redistribute property tax burdens in Ontario. For example:

- reassessment will generate major shifts in tax burdens among individual properties, among classes of property and among municipalities;
- to the extent that exemptions from property tax are narrowed, tax burdens will shift from presently taxed to presently exempt properties;
- movement towards a more neutral business tax will redistribute tax burdens among businesses, on a more equitable basis.

In addition, a number of the basic reforms in other areas will have significant impact on property tax burdens. Mine processing facilities will begin to bear property taxes. The increased provincial grants for education will reduce the tax burden on all properties. Regional school boards and regional governments will tend to even out property tax burdens within their respective boundaries. Finally, any personal income tax credits or refunds for property taxes paid will tend to reduce the ultimate burden of residential property taxes on those families and individuals who are least able to pay.

One remaining element of local taxation which affects the weight of tax between residential and commercial-industrial properties is the split mill rate. In principle, the Government favours the abolition of the split mill rate, as was recommended by both the Smith Committee and the Select Committee on Taxation. The Province is not contemplating such a change, however, until reassessment has been completed and the impact on municipal finances can be carefully examined.

Redistribution of property tax burdens could be brought about, of course, by prescribing new norms for various classes of property right from the outset. This is essentially what the Smith Committee and the Select Committee did in setting out new ratios of taxable assessment to total assessment for various classes of property. The Government is convinced, however, that such a policy would be premature and inappropriate. Given the chaotic and discriminatory state of assessment in this province, there can be no reasonable degree of certainty that any desired distribution among property classes would in fact work out in

practice. Moreover, the effects in individual municipalities of applying prescribed ratios of taxable assessment to total assessment may be substantially different from the effects for the province as a whole. The Province intends to push on with assessment reform, therefore, before attempting to establish any final distribution of tax burdens.

Within the overall field of property taxation there are some classes of property which merit special tax treatment. Transportation and communication properties, for example, must be considered separately from properties in general. The tax treatment of these special properties is still under review by the Province. Farm properties also require special treatment. Generally, the Government believes that the property tax on working farms should be considerably lower than on non-farm properties, because of the limited ability of working farms to pay taxes out of current income. Therefore, if property taxes on working farms show any significant increase when reassessment is introduced, the Province will consider interim measures to hold the line on farm tax burdens. This does not imply that the Government favours continuous tax concessions to all farms, including farms which are held and sold for land speculation. It simply reflects the Government's view that a capital gains tax is a better means of deriving the appropriate taxation from such farms rather than penalizing working farms with impossible property tax burdens.

REFORM OF LOCAL GOVERNMENT STRUCTURE

Ontario has embarked on a long-run program to reorganize and reform its local government structure. This reform program seeks to achieve five major objectives:

- a strengthened and modernized system of local government;
- greater efficiency in the planning, administration and provision of local services;
- reduction of disparities among local governments in the level of services and taxation;
- return of powers to local governments from special-purpose boards and commissions;
- decentralization and regionalization of provincial programs wherever feasible.

The Province is working to realize these objectives by means of three interrelated and complementary policies: the creation of

larger school board units, the consolidation of existing local municipalities, and the establishment of a comprehensive system of regional governments.

The school board policy has already been legislated and implemented. As the new county boards of education become fully operational, some very positive results should begin to emerge. Education services in poorer and more remote areas will be upgraded; the property tax burden of school financing will tend to equalize within counties; and there will be a gradual improvement in the planning and provision of elementary and secondary education across the province as a whole.

The Province is also pursuing an active policy of municipal consolidation in order to reduce the total number of municipalities. A large number of local municipalities in Ontario are far too small to be viable units, either on their own, or within the lower tier of a regional system. Therefore, the Government is working towards a target of larger municipalities. This policy in itself will reduce tax imbalances and improve the efficiency of local governments. Normally, municipal consolidation will occur among lower-tier municipalities at the time of the establishment of a regional government. In areas where regional governments are not imminently planned, however, municipal consolidation will be encouraged on its own merits.

Regional Government

The key element in the structural reform program is the establishment of a system of regional governments. These new units will be urban-based in character, to enable local government to cope more effectively with the problems and needs of Ontario's increasingly urban and urbanizing society and to provide a broader range of benefits to our rural areas. The new regional units will also operate on a much broader scale, thereby providing the strength and cohesion which is lacking in the present municipal structure. This strength of the new regional units has three dimensions:

- a geographic area large enough for proper physical and economic planning;
- a population large enough to achieve economies of scale in the provision of public services;
- a financial base adequate and diversified enough to support a reasonable level and range of services.

As regional governments are established, the Province expects to see major progress towards its structural reform objectives. Powers presently in the hands of special-purpose bodies can be turned over to the new regional governments or to constituent local municipalities. The overall efficiency of local government should improve. Intermunicipal fiscal disparities, both in terms of the level of services and of taxation, should tend to even out. This equalization will occur because each regional government will provide a standard level of required services within its boundaries and will draw upon the tax base of the region as a whole for its financing.

The regional government policy will complement and support Ontario's other reform programs. Creation of regional governments and reduction in the number of municipalities, for example, will facilitate the development of a rationalized system of provincial aid to local government. Reform of local taxation and the regional government program will be mutually reinforcing; province-wide reassessment will ensure that regional governments are developed from a sound fiscal footing, while the improved assessment balance achieved through regionalization will allow a more equitable distribution of tax burdens among classes of property. In addition, the Province intends to work towards common boundaries for school boards and regional governments.

Regional government will also assume growing significance for the achievement of Ontario's regional economic development policies. The Department of Treasury and Economics and the Department of Municipal Affairs are working closely together to ensure that the two programs are coordinated, complementary, and mutually supporting. The broad provincial plans for orderly growth and development in all regions of the province will provide an umbrella for the land use and environmental planning responsibilities of regional governments. Regional government boundaries will be used as basic "building blocks" in drawing up more uniform administrative boundaries for provincial departments, which is one of the objectives of Ontario's "Design for Development". Both the regional government and regional development programs are based, essentially, on the concept of urban growth points. The concentration of provincial expenditures at these growth points as a means of encourag-

ing economic growth and development in each region will result in an expansion of the local tax base of these growth centres. Regional governments will perform the key role of distributing these fiscal dividends throughout the region as a whole, thereby benefiting the rural areas as well as the urban centres. In addition, inter-regional equalization will occur through the discretionary regional allocation of the Province's budgetary expenditures and the program activities of provincial departments and agencies, under the regional development program.

This Government intends to implement the regional government program on a staged basis, giving priority to those areas of the province where the need for regional government is most immediate. The first full-fledged regional government came into existence in Ottawa-Carleton on January 1, 1969. The second regional government will be established in Lincoln-Welland, effective January 1, 1970. Other areas where attention is being concentrated are: Halton-Peel; East and North of Metro Toronto; Kitchener-Waterloo; Hamilton; Sudbury; and Muskoka. The timing schedule for Ontario's regional development program calls for definition of the growth points in all ten economic regions by the end of 1969 and the formulation of economic development plans throughout 1969 and 1970.

SUMMARY AND CONCLUSION

The four reform programs set out in this paper constitute a complete restructuring of provincial and municipal finance in Ontario. The various reform policies are interdependent and complementary; they must be regarded as parts of a total plan, a total "Fiscal Framework for the Future". The changes involved in moving towards Ontario's long-term objectives will be far-reaching and pervasive. The Province intends to implement its reforms, therefore, in measured and coordinated steps, all the while retaining maximum flexibility to consider alternative methods and means.

The Province is convinced that major benefits and improvements will result from its package of fiscal and structural reforms. Provincial and municipal taxation will become more equitable, more efficient and more capable of producing the revenues Ontario will need for development and expansion of essential public services in the years ahead. A major burden of financing will be lifted from the slow-growing and oppressive property tax. The strengthening and modernization of local governments will enable them to meet their present problems and to cope more effectively with the emerging needs of Ontario's urban society. Finally, existing disparities in levels of public services and taxation across the province should gradually be levelled out.

This article represents the framework of Ontario's reform program. A large number of less prominent recommendations in the reports of the Smith and Select Committees have yet to be fully considered before all the details of the reform program can be completed. These recommendations will continue to be reviewed by the Taxation and Fiscal Policy Branch of the Department of Treasury and Economics for possible implementation.

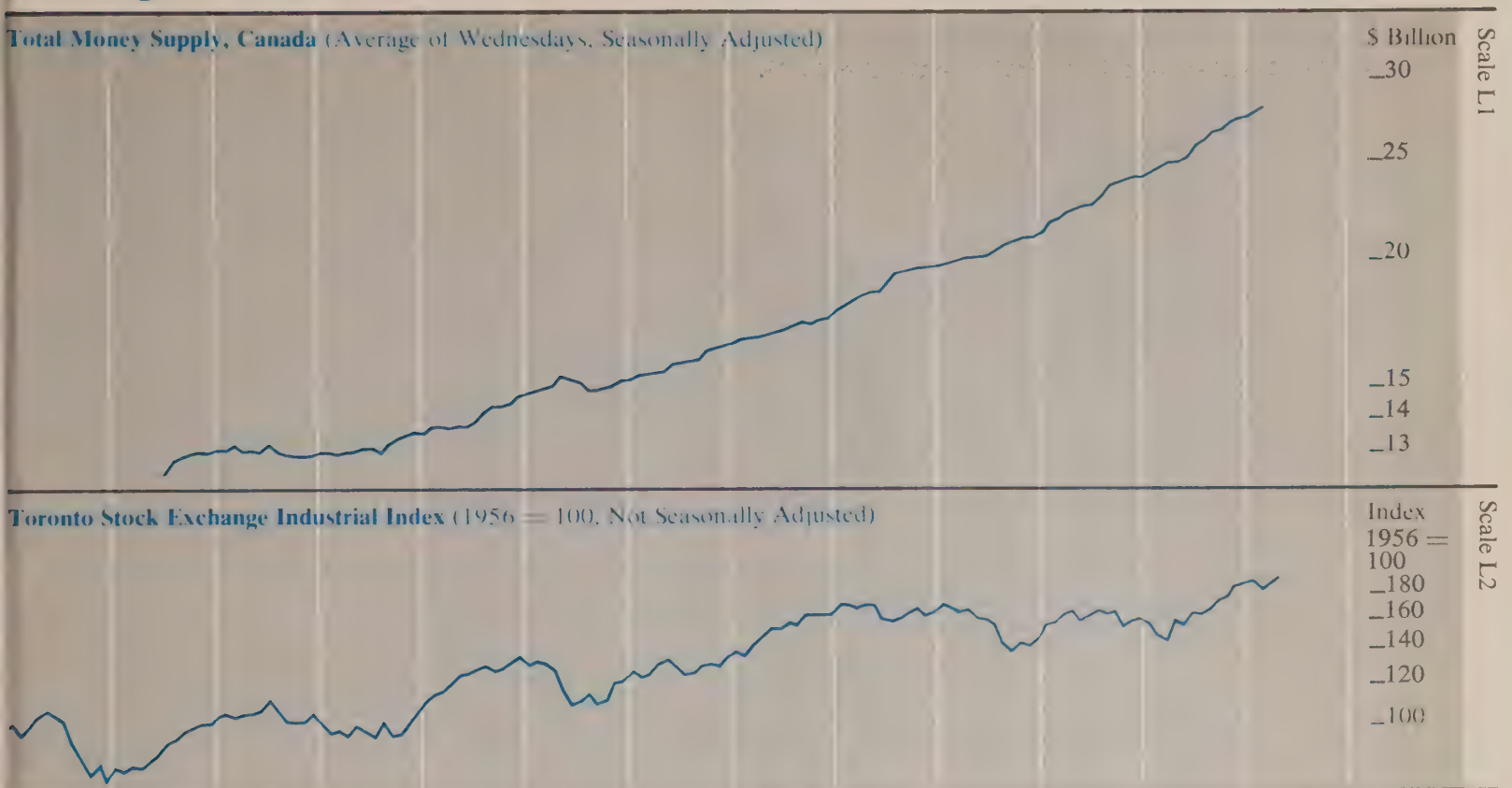
It must be recognized that this reform program will not be costless or painless. As the 1969 budget has pointed out, the first step in the program of fiscal reform must be to contain the growth in public expenditures. But even with continuing restraint, total taxation in Ontario must inevitably increase in the years ahead, unless the fiscal mismatch between the federal and the provincial-municipal sectors is corrected. Redistribution of tax burdens also means additional taxes on some individuals, some properties and some businesses. The Province is convinced, however, that the social and economic costs of maintaining our present system, with all its inequities and defects, would be higher still. Ontario must proceed with fundamental reforms, both because of the intrinsic merits of such reforms themselves, and to provide the basis for constructive and rational development of public finance in this province.

Selected Economic Indicators

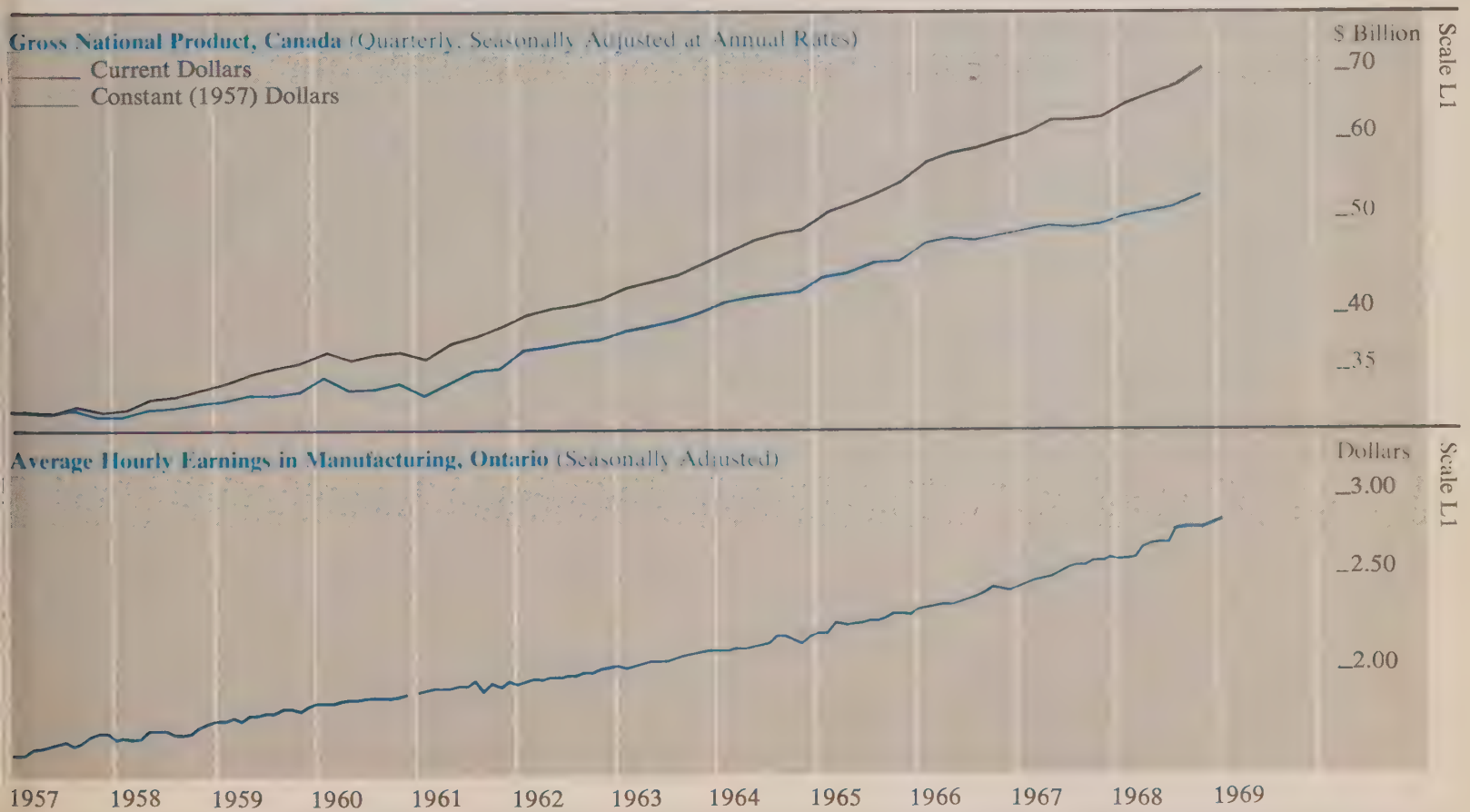
Leading Indicators



Leading Indicators

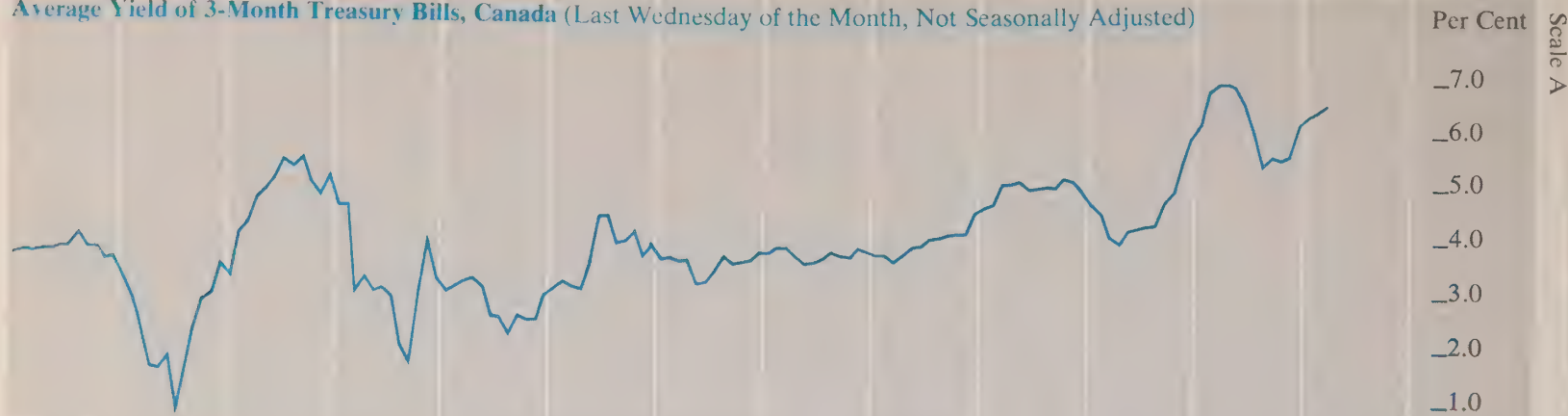


Coincidental and Lagging Indicators



Coincidental and Lagging Indicators

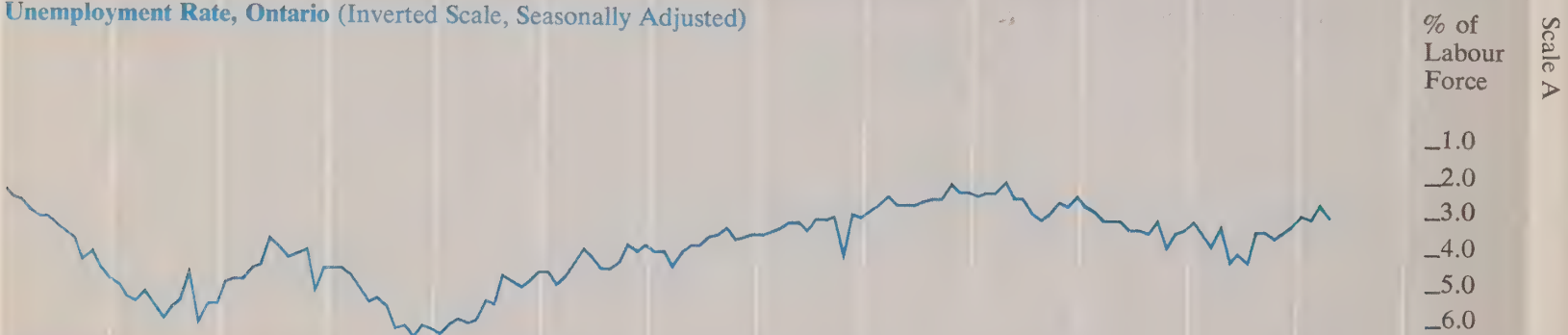
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



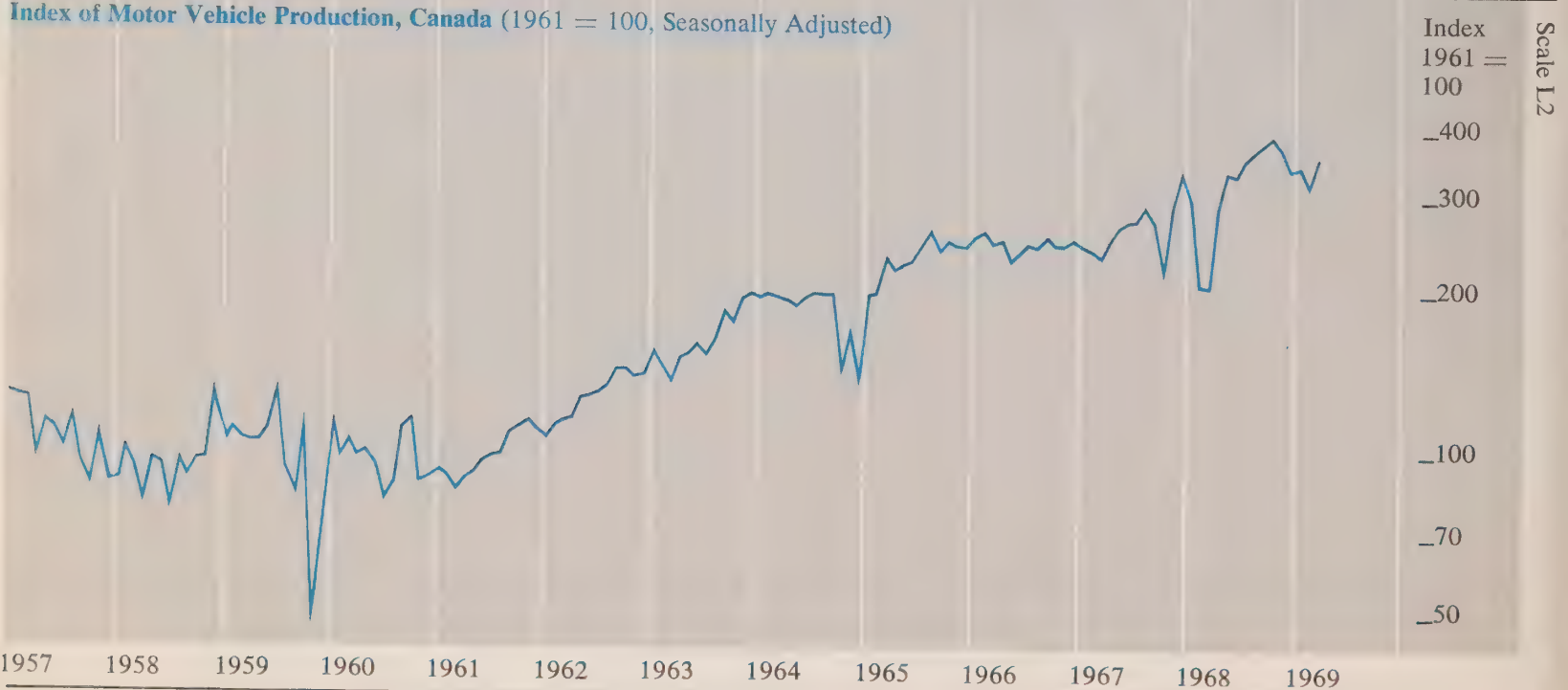
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)



Seasonally Adjusted

		1968										1969			
		Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April
Leading Indicators															
Average Weekly Hours Worked in Manufacturing	Number	39.6	40.6	40.7	40.3	40.3	40.2	40.6	40.6	40.7	40.1	40.5			
New Orders in Manufacturing Industries ^c	\$ Million	3,191	3,276	3,360	3,349	3,377	3,420	3,601	3,581	3,577	3,430	3,518	3,693	3,542	
Business, Industrial and Engineering Construction Contracts	\$ Million	104.6	107.1	123.4	129.3	97.7	101.8	107.8	154.4	125.0	155.0	111.9			
Urban Housing Starts (Annual Rate)	Number	79,400	69,200	63,200	60,800	61,900	63,900	48,900	73,400	83,500	98,200	80,800	109,700	102,400	79,900
Money Supply ^a	\$ Million	24,682	24,972	24,987	25,400	25,846	26,314	26,702	26,827	27,226	27,464	27,580	27,954	28,209	
T.S.E. Industrial Index ¹¹	1956 = 100	146.88	160.43	157.87	166.61	165.93	169.02	176.37	179.61	187.29	188.93	192.47	185.20	190.58	195.31
Business Failures ^a	Number	87	52	50	46	49	28	36	46	48	34	57	59	55	58
Business Failures — Liabilities ^a	\$ Million	5.6	6.4	2.8	6.6	2.9	1.3	1.5	2.1	2.5	1.2	2.9	3.2	2.2	3.2
Coincidental and Lagging Indicators															
Gross National Product ^a (Annual Rate)	\$ Million	65,168			66,328			67,824			70,152				
Average Hourly Earnings in Manufacturing	Dollars	2.60	2.67	2.68	2.67	2.71	2.76	2.78	2.78	2.79	2.81	2.84			
3-Month Treasury Bill Rate ^{c,11}	Per Cent	6.98	6.99	6.95	6.56	6.03	5.48	5.66	5.57	5.66	6.24	6.38	6.43	6.58	
Cheques Cashied in Clearing Centres ¹	\$ Million	5,313	5,031	5,448	5,199	5,381	6,034	5,065	5,821	5,900	5,885	5,698	5,458		
Retail Trade	\$ Million	780	785	779	804	840	835	850	851	862	853	879	886	862	
Labour Force	000's	2,869	2,890	2,918	2,962	2,948	2,937	2,959	3,002	3,026	2,977	3,010	3,037	3,019	3,038
Employed	000's	2,760	2,796	2,796	2,844	2,825	2,837	2,858	2,890	2,923	2,879	2,928	2,947	2,940	2,948
Unemployed	000's	109	94	122	118	123	100	101	112	103	98	82	90	79	90
Unemployed as % of Labour Force	Per Cent	3.8	3.3	4.2	4.0	4.2	3.4	3.4	3.7	3.4	3.3	2.7	3.0	2.6	3.0
Wages and Salaries	\$ Million	1,107	1,130	1,141	1,141	1,142	1,157	1,186	1,198	1,223	1,224	1,236			
Index of Industrial Employment	1961 = 100	125.5	126.0	125.8	124.0	124.1	125.4	126.7	127.8	128.6	129.3	130.5	130.8	131.1	
Index of Industrial Production ^a	1961 = 100	154.9	156.8	158.4	160.1	159.5	159.3	161.6	163.7	165.7	166.0	165.3	167.1	169.7	
Total Manufacturing ^c		154.0	156.4	158.1	159.7	157.8	158.0	161.3	163.7	165.9	165.7	163.5	166.3	169.8	
Non-Durables ^c		145.7	143.5	142.8	146.1	142.1	139.8	142.8	144.6	148.0	149.8	147.6	150.7	152.6	
Durables ^c		164.2	172.2	176.8	176.2	177.0	180.2	183.9	187.0	187.8	185.0	183.0	185.5	190.7	
Mining ^c		152.4	153.3	153.1	154.6	156.1	154.3	152.9	154.0	155.1	154.4	160.2	160.0	159.5	
Electric Power and Gas Utilities ^c		166.6	165.7	169.1	172.1	179.9	179.0	177.5	178.5	179.7	186.7	189.5	184.3	184.7	
Primary Energy Demand (Annual Rate)	BKWH	54.01	53.94	53.81	53.83	55.92	55.69	54.83	57.09	57.89	59.81	59.83	58.45		
Exports (including re-exports) ^a	\$ Million	1,125.7	1,165.3	1,097.2	1,115.9	1,063.5	1,103.5	1,115.0	1,176.4	1,203.2	1,201.8	1,214.9	1,299.8	1,276.1	1,170.0
Imports ^a	\$ Million	970.9	1,026.6	992.2	962.7	927.3	963.0	1,092.1	1,127.2	1,084.3	1,106.0	1,105.6	1,163.3	1,226.2	1,172.8
Unclassified Indicators															
Foreign Exchange Reserves ^a	U.S. \$ Million	2,244	2,416	2,695	2,574	2,515	2,590	2,534	2,525	2,672	2,827	2,864	2,820	2,779	
Industrial Materials Price Index ^{a,11}	1935-39 = 100	253.0	251.2	252.0	253.0	253.4	254.2	253.4	256.8	257.1	258.9	261.4	263.5	264.1	269.6
Consumer Price Index ^{a,11}	1961 = 100	118.6	119.3	119.3	119.7	120.4	120.7	121.1	121.4	121.9	122.3	122.6	122.6	123.2	124.6

^aStatistics for Canada.

¹¹Not seasonally adjusted.

¹Ontario less Toronto.



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Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics
H. Ian Macdonald, Deputy Minister



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The Ontario Economy

St. Lawrence Seaway—Impact on Ontario

K. W. Foley, *Economist*

Department of Treasury and Economics

Selected Economic Indicators

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Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About the Review

In conjunction with the tenth anniversary of the St. Lawrence Seaway system the feature article for the July/August edition of the *Ontario Economic Review* presents an assessment of the importance of the Seaway to the Province of Ontario.

Construction of the integrated Seaway was started in August 1954 and officially opened in June 1959 providing a 2,300-mile river, lake, lock and canal complex — one of the world's longest navigable inland waterways. Since then, much controversy has been raised concerning the actual importance of the Seaway as a transportation route for the abundant natural resources and agricultural produce of the surrounding areas as well as its suitability for navigation by ocean-going vessels.

The survey, carried out from the point of view of the Province of Ontario provides an analysis of the magnitude of the benefits to each port located within the province in terms of the origin or destination of commodities shipped or received from each port, the effect of the Seaway on the pattern of cargo movements and estimated changes in the level of investment in each port since the opening of the St. Lawrence Seaway.

This article, an extract from the longer study, was prepared by Mr. K. W. Foley, Economist, with the Economic Planning Branch, Policy Planning Division of the Department of Treasury and Economics. The author acknowledges with appreciation the assistance of Miss Carol Nickel, also of the Economic Planning Branch, in the preparation of this study.

Indicator Charts, Pages 13-15

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 13-15 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

Recent data released by the Dominion Bureau of Statistics indicate the possibility of a slowdown in the vigorous advance of the Canadian economy. The evidence is far from conclusive and rests as yet on the results of one or two months. However, although inflationary price and wage increases continue to threaten, a trend toward a moderating growth rate in the second half of 1969 seems quite probable. While further confirmation is required, the economy does seem to be coming under the influence of the Bank of Canada and federal government policies of restraint. Such an alteration would bring Canadian performance more in line with the reduced rate of expansion in the United States.

Evidence for this development can be found in preliminary estimates of exports for the first half of 1969. While totalling \$7.3 billion, up 12.0 per cent from the comparable 1968 period, the year-to-year gain for exports has dropped from 15.2 per cent in the first quarter to 9.6 per cent in the second quarter. In the first half, the whole of the increase in shipments continued to occur in sales to the United States with about one half of the gain reflecting higher shipments of motor vehicles and parts. However, much of the expected gain in auto exports for 1969 has taken place and the U.S. dock strike earlier this year, which encouraged imports from Canada, has been settled. Moreover, the U.S. housing industry has weakened after stimulating a sharp rise in both the volume and price of lumber purchases from Canada earlier in the year.

With U.S. real growth slackening and the export market for Canada's wheat weakening there is little reason to look for a significant upsurge in Canadian exports in the second half of 1969.

In other areas, the sharp drop of 2.0 per cent in the seasonally adjusted April index of industrial production is considered to be a further indication of moderating growth especially when followed by the marginal decline in May. Manufacturing shipments in April were down 3.1 per cent following a marginal drop in March, however, this situation was influenced to some degree by labour unrest and material shortages.

Additional support for a weakening trend is evident in recent unemployment figures. At the national level, unemployment which averaged 4.8 per cent of the labour force in 1968 fell to 4.3 per cent in the first quarter of this year. Since then, it has increased to 4.4 per cent in April and 4.9 per cent in May.

This rapid increase in unemployment is partially the result of a faster-than-usual expansion of the labour force, even at this time of year.

In Ontario unemployment averaged 3.6 per cent of the labour force during 1968 and dropped to an average of 2.7 per cent in the first quarter of this year. Since then it has followed the national lead rising to 3.0 per cent in April and 3.7 per cent in May. As at the national level this increase is partially attributable to a larger-than-average influx into the labour force.

Construction

Ontario's construction activity in May expressed in terms of contracts awarded (not seasonally adjusted), as recorded by *Southam Building Guide*, increased by 18.0 per cent over the corresponding month in 1968. In May the total value of contract awards was \$301.0 million compared with \$255.2 million in the same month last year. The May 1969 total while remaining high shows a slight decrease from the total for April possibly reflecting the anticipated easing of corporate profits after the strong first quarter, together with tight money and a slowing in the growth of final demand. As a result some postponement of capital investment may be taking place as is happening in the United States.

Reflecting the strength of the first quarter the total value of construction awards in Ontario for the first five months is 29.0 per cent above the corresponding value for 1968. In the other major economic regions of Canada, British Columbia, the Maritimes and Quebec recorded gains of 29.0 per cent, 17.0 per cent and 9.0 per cent respectively, while contract awards decreased by five per cent in the first five months in the Prairie Provinces.

At the national level data for the month of May indicate a continuation of the overall upward trend that was established early in the year. Percentage changes for the various categories, when comparing May 1968 and May 1969 data are: residential, up 11.0 per cent; commercial/institutional, up 8.0 per cent; industrial, down 8.0 per cent with total building construction up 7.0 per cent and engineering contract awards up 8.0 per cent. Comparison of cumulative five-month totals for 1968 and 1969 shows residential, up 16.0 per cent; commercial/institutional, up 28.0 per cent; industrial, up 1.0 per cent; total building construction up 20.0 per cent and engineering awards up 18.0 per cent.

Large construction awards in Ontario for the month of May, each valued at \$1.0 million or more, totalled \$72.2 million. Some are listed below.

Large Construction Awards Placed Recently in Ontario

Location	\$ Million	Description
Chelmsford	2.5	Apartments
Goulbourne Twp.	1.0	Swimming Pool
Guelph	1.0	Water Reservoir
Hamilton	1.9	Incinerator Alterations
Hanmer Twp.	3.3	School
Kingston	12.0	College Additions
Kitchener	1.7	Hotel
London	26.6	College Expansion
London	1.7	Schools
March Twp.	5.3	Schools
Metro Toronto	12.5	School and College Extensions
Millhaven	3.1	Heating Plant
Nepean Twp.	1.4	Housing
Ottawa	3.0	Office Buildings
Stoney Creek	1.1	Apartments
Vanier	15.0	Apartments
Various locations	20.0	Provincial Highway Projects
Windsor	4.2	Apartments

Source: Southam Building Guide.

In terms of actual housing construction, the number of dwelling unit starts in Ontario centres of 10,000 population and over was 6,399 in May, 25.0 per cent less than in the corresponding month of the previous year but 18.0 per cent above the April 1969 level of 5,443. The cumulative total for the first five months of 1969 was 25,429, 13.0 per cent higher than the same period last year. May starts in Toronto at 3,162 were down 27.0 per cent from May 1968 but up 41.0 per cent in comparison to the preceding month. This brought the cumulative five-month total for Toronto to 12,199, a decrease of 0.3 per cent from the corresponding level in 1968. In addition, the proportion of Ontario's urban starts accounted for by Toronto declined from 54.0 per cent in the first five months of 1968 to 48.0 per cent in the corresponding period of the current year. Across the province, in percentage terms, major centres with large increases in May included Cornwall, Sudbury, Oshawa, Kingston, Windsor and Fort William/Port Arthur. The largest percentage decreases occurred in Peterborough, Lindsay and Georgetown.

For the year to date house-building has been one of the most buoyant sectors of the economy, however, year-to-year advances have tended to be moderate. In the past two months conditions in the residential mortgage market have deteriorated with the further rise in interest rate costs and a contraction in the supply of available funds. As a result there is some speculation that starts in the second half of 1969 may be down from the first half and less than those in the second half of 1968.

Dwelling unit completions in Ontario centres of 10,000 population and over numbered 6,838 in May, up by 15.2 per cent from 5,937 in April. When compared to May 1968 this represents an increase of almost 200 per cent. Toronto with 5,482 units accounted for 83.0 per cent of the total with the greatest concentrations in North York, Toronto City, Mississauga and Scarborough. At May 31st, there were 54,492 dwelling units under construction in Ontario, 16.2 per cent more than the 46,914 units under construction one year earlier.

Gross National Product

The rapid pace of economic activity con-

tinued in the first quarter of 1969 as the Gross National Product increased by 2.5 per cent to reach a level of \$71.9 billion, seasonally adjusted at annual rates. According to recently published DBS figures the advance in terms of constant 1957 dollars was approximately 1.5 per cent, allowing for a price increase of one per cent, slightly higher than in the fourth quarter of 1968. This buoyant performance in the first quarter was generally anticipated and reflects the brisk pace set by the economy in the second half of 1968.

Intensified demand pressures in most sectors, partially met from substantially higher imports, characterized the first quarter. In comparison to the fourth quarter of 1968 larger advances occurred in personal expenditure, business gross fixed capital formation and exports, together with increased investment in business non-farm inventories. In contrast, government purchases of goods and services rose only slightly while accumulation of farm inventories declined sharply, partially as a result of much higher wheat exports.

Personal expenditure on consumer goods and services rose substantially to a level of \$43.5 billion, seasonally adjusted at annual rates. This represents an increase of three per cent from the fourth quarter of 1968. All major categories with the exception of automobiles and tobacco recorded gains as the advance in consumer outlays outpaced a one-per-cent increase in disposable income resulting in a sharp decline in personal saving. Gross fixed capital formation increased by 3.5 per cent largely as a result of an expansion in new residential construction as housing starts in the first quarter of 1969 rose 37.5 per cent over starts in the corresponding quarter of 1968. Outlays for plant and equipment advanced at the same moderate rate as in the fourth quarter of 1968 with a five-per cent gain in the machinery and equipment component outweighing a drop of three per cent in non-residential construction.

Government purchases of goods and services advanced by one per cent, the smallest increase in six quarters as the government sector as a whole exercised a restraining influence on the economy. With total revenue of all governments combined (including the

Canada and Quebec Pension Plans) rising more sharply than expenditures, the government surplus, seasonally adjusted at annual rates and on a National Accounts basis, increased from \$1,376 million in the fourth quarter of 1968 to \$2,188 million in the first quarter of this year, the largest in recent years. At the federal level, revenues rose by about 3.5 per cent while expenditures increased by almost two per cent. As a result the federal surplus moved from a rate of \$248 million in the fourth quarter to a rate of \$452 million in the first quarter. Provincial-municipal revenues rose by 4.5 per cent and expenditures were virtually unchanged so that the provincial-municipal surplus increased from a rate of \$84 million to a rate of \$692 million.

Reflecting the strength of demand by both Canadians and non-residents, exports and imports registered their largest increases since the first quarter of 1968. Merchandise exports advanced 5.5 per cent, led by large gains in wheat, wood pulp, newsprint, and a number of metals. Merchandise imports rose more rapidly at a rate of 7.5 per cent, with sizable advances in non-farm machinery in line with the larger domestic investment program.

More recent data on Canadian Trade indicate that imports continue to grow more rapidly than exports. Preliminary figures for June record imports at \$1,266.5 million, 28.7 per cent higher than the corresponding figure in June 1968. In the first six months imports totalled \$7,081.3 million, up 17.8 per cent over the first six months of 1968. Exports too have increased, however, with the exception of February the monthly year-to-year growth rate of imports has exceeded that of exports. June exports at \$1,287.7 million were 14.8 per cent higher than for June 1968. For the six-month period exports totalled \$7,283.0 million, or 11.8 per cent above the six-month total for 1968. The resulting cumulative trade balance of \$201.7 million is less than one half of that recorded in the first six months of 1968.

Among components of income in the first quarter, labour income advanced by three per cent with both goods-producing and service-producing sectors having the same rate of increase.

St. Lawrence Seaway—Impact on Ontario

3

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INTRODUCTION

The St. Lawrence Seaway has often been raised, applauded, and at the same time, feared as a force capable of changing the economic fabric of central and eastern North America. Much has been said about the importance of the Seaway as a transportation route and indeed, these facilities have provided benefits to the areas lying adjacent to it. The question, of course, arises as to the magnitude of these benefits and the location of the major beneficiaries. Ontario, despite its location, has not participated substantially in the benefits arising from this waterway and it is evident after 10 years of operation that the potential benefits to Ontario are still greater than the accomplished facts. The Great Lakes and the St. Lawrence River form the southern boundary of the Province of Ontario and the northern boundary of the States of New York, Ohio, Michigan and Wisconsin and as such it is to be expected that this natural and artificial waterway will capture large trade flows. The St. Lawrence Seaway does handle large cargo movements and is a very important asset for specific trade movements such as iron ore, coal, petroleum and grain products. In 1968 the Seaway canals moved, upbound and downbound, 66 million tons of cargo.

In order to assess Ontario's position we have recently undertaken a survey of all Ontario Great Lakes ports in an attempt to locate these beneficiaries and determine the size of the benefits. This survey was carried out solely from the point of view of Ontario and assesses direct benefits only. Each port within the Province of Ontario, located on either the St. Lawrence River or the Great Lakes, was examined to determine:

the commodities shipped and received from each port

the origin or destination of the commodities handled, thereby examining the Great Lakes trade routes and their effect on Ontario ports

the change in cargo movements since the opening of the St. Lawrence Seaway in 1959

the approximate changes in the level of investment in each port and how these changes relate to the St. Lawrence system.

From this material some assessment could be made of the importance of the St. Lawrence Seaway system to Ontario. The data used in this report was largely provided by the Dominion Bureau of Statistics from their

annual *Shipping Report*. The year 1967 was used for the international movements and the year 1966 was used for the coastwise movements. (This was necessary due to the non-availability of 1967 coastwise traffic data, and while this presents some problems and probable inaccuracies, the changes from year to year should produce only marginal errors. It is our opinion that this factor does not greatly affect the conclusions.)

The St. Lawrence Seaway system as defined in this survey includes all of the canals on the St. Lawrence River and the Welland Ship Canal; it does not include the locks at Sault Ste. Marie. This definition was used for the following reasons:

- 1) there are no tolls applied to the locks at Sault Ste. Marie;
- 2) with the opening of the Sault Ste. Marie "Poe locks", which are owned and operated by the U.S. government and are independent of other Seaway facilities, there exists a distinct difference in operation, character, ownership and economic significance of these facilities from other Great Lakes and St. Lawrence facilities.

The above definition of the St. Lawrence Seaway system classifies any traffic both originating and terminating at ports above the Welland Canal as "intra-lake traffic" and therefore not utilizing the St. Lawrence Seaway facilities.

The St. Lawrence Seaway system traffic and water-borne transportation in general is characterized by a large unit load and substantial economies of scale. The inland trade routes are particularly specialized as the vessels in major trades are both adapted to the commodity handled and the route travelled. The dimension of the Seaway facilities and the loading characteristics of the major trades have created a class of vessel that is particularly suitable to the Great Lakes traffic.

The characteristics that appear to make a commodity trade attractive to inland water-borne movement are:

- *Length of haul:* In the following table we can see the comparison between the length of hauls for the major cargoes on both domestic and international traffic. Almost all of the major commodities have a length of haul over 500 miles, coal and fuel oil being the main exception.

Water transportation has an extremely low ton-mile cost for the line haul portion of a voyage in comparison with that of overland modes. The large unit loads spread over relatively low operating costs per mile serve to bring about this result. This means that terminal costs become an important factor in efficient ship operation. The greater the percentage of time that a ship spends in port, the higher the ton-mile costs.

Length of Haul for Major Commodities Transported on the Great Lakes, 1965

Product	Canadian Coastwise Trade		International Seaborne	
	Avg. Length of Haul ¹ miles	Weighted Avg. Length of Haul ² miles	Avg. Length of Haul ¹ miles	Weighted Avg. Length of Haul ² miles
Grain Products (Wheat)	752.25	1,092.63	1,210.83	1,203.18
Other Grain Products	792.68	1,039.93	958.57	1,286.53
Wood Products	462.14	330.89	856.82	703.51
Iron Ore	561.21	559.65	798.34	931.89
Coal	598.80	1,079.57	265.19	213.15
Gypsum	1,032.50	918.18	—	—
Newsprint	605.40	604.26	1,058.79	1,006.76
Fuel Oil	290.44	294.00	—	—

¹ distance between origin and destination (average).

² average length of haul weighted by tons carried.

Notes: These figures represent only those cargoes where Canadian ship operators can compete for the traffic. They do not include American domestic movements.

A vessel will incur basically the same costs while in port as when underway; some increases in fuel costs will occur when underway but these are probably offset by terminal charges and terminal services when in port. The vessel does not earn revenue while in port and, therefore, these costs become overhead costs which must share the revenue earned while underway. The longer a vessel spends in port the higher will be the ton-mile cost and the more competitive the overland modes of transport will be. The long length of haul reduces the port time as a percentage of the total time in operation and increases the utilization of the revenue-earning capacity of the vessel.

- *Homogeneous products:* In almost all cases major cargoes are made up of a homogeneous product, that is, one particular unit of the product is not much different than any other. This eliminates any sorting or classifying of these products. This is not the case with general cargo, as a particular shipment must go to a particular consignee, and must be identifiable from all other shipments. The fact that the major commodities are homogeneous products reduces the terminal handling costs and allows the use of automatic unloading services. This fact is particularly important as pointed out above.

- *High density of movement:* The major cargoes and the major trade routes are considered high-density traffic, with large volumes moving between relatively few points. This is the case in all but a few of the major cargoes. The exceptions to this would be the wood products and petroleum products as these latter commodities involve a distribution or feeder type of operation. These high-density movements allow larger ships to operate efficiently as the larger the ship's capacity the greater the number of revenue tons on which to spread the fixed terminal and overhead costs. This results in lower ton-mile costs and a further competitive advantage over land-based modes. However, unless there is sufficient density of traffic these large ships could not obtain a high load factor. (The percentage of total ship capacity that the current load occupies.) Because of the high fixed costs and the relatively low out-of-pocket operating cost each additional unit of capacity utilized contributes heavily to overhead and pro-

fits. Thus high density of traffic is necessary to maintain the low ton-mile costs that keep the shipping lanes competitive.

Having examined some of the characteristics of Great Lakes ports' cargo it is interesting to note that most of the cargo is loaded and unloaded from a very few ports. There are basically three major ports within the province and perhaps three subsidiary ports. This fact is illustrated in the following table:

Water-Borne Traffic Handled in Ontario

Port	Coastwise Trade		International Trade	
	Loaded	Unloaded	Loaded	Unloaded
	000's Tons		000's Tons	
Port Arthur	14,493.0	1,164.6	3,846.0	368.9
Hamilton	503.7	2,703.4	305.7	6,549.2
Toronto	276.6	1,935.4	255.9	3,395.4
Sarnia	2,374.3	498.8	207.3	1,083.1
Sault Ste. Marie	239.2	960.9	209.5	2,918.9
Windsor	558.1	549.0	586.7	1,259.6
Total of Major Ports	18,444.9	7,812.2	5,411.2	15,575.3
Total Ontario Ports	22,520.3	16,089.9	9,470.2	21,590.4

The six ports indicated above represent a major portion of the total water-borne traffic handled in Ontario. The following percentage applies to each trade route:

Cargo Volume of Top Six Ports as a Percentage of Total

	Coastwise Trade		International Trade	
	Loaded	Unloaded	Loaded	Unloaded
Top Six Ports	18,444,976	7,812,162	5,411,195	15,575,283
Total Ontario Ports	22,520,302	16,089,919	9,470,237	21,590,375
Top Six as Per Cent of Total	81.9	48.6	57.1	72.1

In each of the above trade routes, if one or more port is added to the "top six" ports then the percentage of total will increase dramatically. For example:

- *Coastwise loading:* If the limestone movement from the Port of Cobourg is added to the coastwise loadings then these ports represent 87 per cent of total loadings;

- *Coastwise unloading:* If the unloadings of 1,551,847 tons at Clarkson and the 1,129,028 tons at Port Credit are added to the unloadings of the above ports then these ports represent 65 per cent of total unloadings;

- *International loadings:* If the loadings of iron ore at Depot Harbour, Picton, Little Current and the dolomite loadings at Port Colborne are added to the above ports then these ports represent 91 per cent of total international loadings;

- *International unloadings:* If the coal unloadings at Port Credit are added to the international unloadings at the above six ports then these ports represent 85 per

cent of the total international unloadings.

In addition to handling the majority of the cargoes on the Great Lakes these same six ports handle much of the intra-lake traffic. The ports of Toronto, Hamilton and Port Arthur, because of their geographic position and the type of cargo handled, reap major benefits from the Seaway and the percentage

of intra-lake traffic from these ports is rather small. The same is not true of the ports of Sarnia, Sault Ste. Marie and Windsor, as the intra-lake percentage of traffic from these ports is extremely high.

The majority of the smaller ports in Ontario are in the same classification as these latter harbours. They handle large amounts of intra-lake traffic, usually for a very few specialized industries.

Toronto — intra-lake as a per cent of total domestic cargoes 22.4; intra-lake as a per cent of total international cargoes 3.8.

Port Arthur/Fort William — intra-lake as a per cent of total domestic cargoes 27; intra-lake as a per cent of total international cargoes 78.6.

Sarnia — intra-lake as a per cent of total domestic cargoes 76.7; intra-lake as a per cent of total international cargoes 90.8.

Sault Ste. Marie — intra-lake as a per cent of total domestic cargoes 88.4; intra-lake as a per cent of total international cargoes 99.4.

Windsor — intra-lake as a per cent of total domestic cargoes 52.0; intra-lake as a per cent of total international cargoes 96.8.

CARGO MOVEMENTS ON THE GREAT LAKES

During the 1967 shipping season 37,045,597 tons of cargo were transported on the Great Lakes. Of this total:

76,721,288 tons or 56.0 per cent did not utilize any of the St. Lawrence Seaway Canals;

17,600,454 tons or 12.8 per cent utilized only the Welland Canal;

36,076,263 tons or 26.3 per cent utilized both the Welland and the St. Lawrence River Canals;

7,771,676 tons or 5.6 per cent utilized only the St. Lawrence River Canals.

Thus, the majority of the traffic on the Great Lakes did not utilize Seaway facilities, and only 26 per cent travelled through both the Welland and the St. Lawrence River Canals, thereby obtaining the maximum benefit from the Seaway expansion. Of the cargoes moving *upbound* through both the Welland Canal and the St. Lawrence River Canals 68.5 per cent of the total 19 million tons was made up

of iron ore and related steel-industry products. These shipments were moving from the Sept Iles ore docks to the U.S. Lake Erie steel mills. The balance of the upbound traffic was composed of minor quantities of fuel oil, newsprint, miscellaneous cargoes and approximately four million tons of general cargo moving through the canal system to U.S. cities of Chicago, Milwaukee, Detroit, etc.

Of a total 19 million tons of cargo transiting both sets of canals, 86.4 per cent was cargo destined to U.S. ports from other than Ontario ports.

The *downbound* flow of goods indicates somewhat the same pattern; however, in this case the predominant cargoes are grain and grain products. In 1967, 8.5 million tons of wheat and corn moved downbound through both the Welland and the St. Lawrence River canals. The origins of these cargoes were largely Port Arthur and Chicago, the former handling wheat and the latter handling corn. In addition, significant volumes of barley and soya beans were moved through both sets of canals. The volume of these commodities was approximately two million tons. Thus, of a total of 16.1 million tons of cargo moving downbound through both canal systems, 65.2 per cent was composed of grain products.

The major volume of these grain cargoes is handled in a very few ports. The grain shipments from Ontario originate almost totally in Port Arthur since this port functions as an interface between the grain growing regions on the prairies and the markets of the world. The benefits accruing to Ontario from the movement of these cargoes lies totally in the investment and employment created by these terminal operations.

The Iron Ore Traffic

As outlined above a large percentage of the traffic moving on the St. Lawrence Seaway is related to the steel industry. The 1967 upbound movements through the St. Lawrence River canals consisted of approximately 16.3 million tons of iron ore. Approximately 2.8 million tons were destined for Hamilton steel mills and the balance to Lake Erie U.S. steel mills. The source of this iron ore is the Quebec/Labrador area iron mines.

The ownership of these mines is set out as follows:

- The Iron Ore Company of Canada (operator of seven mines — annual production 14 million tons) is owned by:
 - a) Hollinger Consolidated Gold Mines
 - b) Hanna Mining Co.
 - c) The M.A. Hanna Co.
 - d) National Steel Corp.
 - e) Republic Steel Corp.
 - f) Armco Steel Corp.
 - g) Youngstown Sheet and Tube Corp.
 - h) Wheeling Steel Corp.
 - i) Bethlehem Steel Corp.

This operation is almost totally owned and operated by U.S. steel producers and the majority of its output is delivered to mills in the northeastern states, particularly on Lake Erie.

- The Quebec Cartier Mining Company — annual output — 8,000,000 tons. This mine is a wholly owned subsidiary of the United States Steel Corporation.
- Wabush Mines Ltd. — annual output approximates 6,000,000 tons. This mining operation is owned and operated by:
 - a) Pickands Mather & Co.
 - b) Youngstown Sheet & Tube Co.
 - c) Inland Steel Co.
 - d) Interlake Steel Corp.
 - e) Pittsburgh Steel Corp.
 - f) Finsider
 - g) Steel Co. of Canada Ltd.
 - h) Dominion Foundries & Steel Ltd.

It is estimated that Canadian ownership and participation in this mining activity is approximately 38-40 per cent, the balance being owned by U.S. steel interests.

An analysis of both the traffic flows and the ownership of the mining operations suggests that there are substantial benefits from the St. Lawrence Seaway accruing to the U.S. steel industries and the carriers engaged in handling this commodity.

The 1967 volume of iron ore from the Quebec/Labrador iron deposits moving to Ontario steel centres represents approximately one-sixth of the total shipments from these deposits. The remaining five-sixths, unlike the volume moving to Hamilton, transits both canal systems and thus receives maximum benefits from this waterway.

In recent years both the Dominion Foundries and Steel Co. and the Steel Co. of Canada have constructed iron ore mining and pelletizing operations in Northern Ontario. In the case of Dofasco some portion of their supply of iron ore pellets does not

move via the Seaway at all as these shipments now arrive from the Sherman mine at Temagami via rail unit train. Stelco's operations at Bruce Lake may also avoid utilizing the St. Lawrence canal system since the Company is currently undertaking a plant construction program on the northern shore of Lake Erie. If this plant were completely supplied from the Bruce Lake area the need for Welland Canal transits would be eliminated.

While the steel companies have some ability to change supply locations this is somewhat limited.

Of particular significance is the fact that this iron ore trade is controlled by a relatively few producers and few purchasers, that is, the iron ore cargoes are largely captive products. The St. Lawrence Seaway Report carried out by J. Kates and Associates¹ states,

"By far the greater part of the North American iron ore producing industry is owned or controlled by the nine largest steel producers in the United States supplemented by two Canadian producers located in Hamilton. The balance is controlled by four iron ore houses, which although they produce ore for sale only, are closely tied to the steel makers. Iron ore is therefore largely a 'captive' product and ownership patterns and policies exert considerable influence on development and on the ability of various ores to retain traditional markets."

These steel producers control much of the world's iron ore output and therefore any changes in investment policies are likely to have a great deal of effect on the tonnage of ore moving via the various trade routes. In spite of this these mining ventures in the Quebec/Labrador and the Mesabi ranges represent "huge investments" by these steel companies and as such they are likely to be ensured of continual operation for some time. It is to be expected however that there will be fluctuations in the tonnage handled in each trade route as the steel companies shift their demands among their various holdings.

The Grain Trade

Grain originating in the Canadian prairies is being shipped to export ports such as Montreal, Baie Comeau, Sorel and Trois Rivières. This grain travels the complete length of the Seaway, from the Lakehead area to the St. Lawrence and Atlantic sea-

ports and, therefore, in terms of ton-miles produced, is a very significant trade route.

Canadian grain is marketed by a marketing monopoly under the sponsorship of the Federal Government. This marketing body is known as the Canadian Wheat Board. Its function is to purchase the grain production of the Canadian Prairies and to market it in such a way that the farmers obtain an optimum price for their endeavours. The Wheat Board prices the grain at the export terminal at the delivered prices less the transportation costs. By this pricing mechanism the Wheat Board can control the flow of grain out of various ports, as a change of a few cents in the base price of one port over another will either attract or divert shipments from or to other ports.

The Wheat Board has had a large effect on decreasing the incentive for direct overseas shipments of grain from the Lakehead on ocean going ships, as the Board's prices at the Lakehead are higher on a *basis in store* level than at the lower St. Lawrence ports. This has given the Great Lakes ship operators a very economical operation in hauling grain to the lower St. Lawrence ports and returning with iron ore cargoes. The combination of the price differential and the availability of backhaul cargoes has prevented ocean-going ships from competing for this traffic on any scale. This policy also ensures an adequate and stable supply of ships to move the export grains to the Atlantic ports.

The Prairie grains flow to export ports through the price mechanism, that is the more efficient lower cost ports and transportation routes will attract the grain shipments from a greater hinterland. The handling capacity at the various ports has also been a determinant in allocating export shipments. The Pacific terminals are the most attractive from a cost point of view, however the volume of shipments from these points is limited by (1) the distance from producing areas, and (2) the terminal capacity of elevators, etc. The latter is not necessarily a long-term factor and can be altered with increases in the stock of these storage facilities. The Seaway is the second most attractive route for export grains and is well developed with elevator capacity.

It appears that the Seaway is and will continue to be a well established route for export grain. Several new elevators have been constructed on the lower St. Lawrence above Quebec City and these will attract additional grain exports.

Domestic Grain Trade

A modest number of grain shipments are handled at Ontario ports and these cargoes are largely grain for domestic consumption or feed grains for feed lot production. The largest volume of this domestic grain is handled at Lake Huron, Georgian Bay and Lake Erie ports such as Midland, Collingwood, Port Colborne, Port McNicoll, Windsor and Goderich. This cargo does not utilize any of the St. Lawrence Seaway facilities and therefore can not be considered a beneficiary of such facilities.

Coal Trade

The coal movements on the Great Lakes are almost totally destined to either steel mills or thermal electric generating stations. These major coal movements originate at the U.S. Lake Erie ports of Toledo, Conneaut and Ashtabula and are destined to Toronto, Port Credit, Sault Ste. Marie, Sarnia, Windsor and Hamilton. In 1966, 14.6 million tons of coal were shipped on the Great Lakes largely from Lake Erie ports and of this total 11.5 million tons or 78.8 per cent were received at the above ports.

The international coal movements on the lakes have a relatively short length of haul, however the water-borne movement is justified because of the extremely high density of movement to these particular ports and the automated unloading facilities that are installed on the vessels engaging in this trade.

A large percentage of these coal movements are intra-lake movements and as such do not receive benefit from the St. Lawrence Seaway (with the exception of the benefit of using larger vessels to haul this commodity). In many cases however these seaway-size vessels could operate captive to the upper lakes.

The two main Ontario beneficiaries of the St. Lawrence Seaway coal trade are the Hamilton steel companies and the Ontario Hydro Electric Commission. In 1966 these organizations received approximately 7.2 million tons of coal through the Welland Canal system. (Of this 7.2 million, the Lakeview and Hearn generating stations received 4.1 million tons.)

There are two significant implications of this coal movement:

- The water-borne movement of coal to thermal generating stations reduces the cost of electric power to most consumers in the Metropolitan Toronto region. This

¹St. Lawrence Seaway Tolls and Traffic: Analyses and Recommendations, J. Kates and Associates, Toronto, Ontario, December 1965.

Weight in Tons of Inputs to the Iron and Steel Industry 1960-1966

	1960	1961	1962	1963	1964	1965	1966	TOTALS
	Tons							
Bituminous Coal								
Canadian	585,077	434,036	400,613	478,469	459,820	262,921	150,658	2,860,550
Imported	3,997,179	4,355,155	4,538,280	4,716,113	4,865,783	5,033,297	5,164,796	32,737,146
Total	4,582,256	4,789,191	4,938,893	5,194,582	5,325,603	5,296,218	5,315,454	35,597,696
Iron Ore								
Crude:								
Canadian (S) ¹	704,667	407,976	464,897	578,185	488,964	547,924	78,758	3,974,371
Imported (S) ¹	725,525	1,025,947	1,071,069	823,571	936,760	442,786	626,012	5,797,934
Canadian (B) ²	1,487,833	946,398	915,080	710,024	548,954	778,489	436,573	7,970,080
Imported (B) ²	2,102,651	2,075,089	1,815,257	1,776,952	1,290,956	1,375,407	1,070,856	16,513,637
Other:								
Canadian	1,014,910	1,354,098	1,482,514	2,073,137	2,571,241	3,157,365	4,245,354	17,852,625
Imported	774,785	1,786,286	2,419,695	3,050,640	3,637,373	3,714,208	2,986,219	18,809,971
Total	6,810,371	7,595,794	8,168,512	9,012,509	9,474,248	10,016,179	10,146,772	70,918,618
Limestone								
Canadian	502,831	421,394	388,303	427,784	413,237	448,234	328,504	3,477,195
Imported	292,685	348,741	331,694	333,748	331,107	309,536	251,308	2,507,916
Total	795,516	770,135	719,997	761,532	744,344	757,770	579,812	5,985,111

¹ (S) — ore destined for Sinter plants

² (B) — ore destined for blast furnaces

Totals include data for years 1958 and 1959 not shown here.

reduction may not be realized by the local users only, as the power generated is fed into a national power grid and therefore this lower power cost is transferred throughout the system. It is evident that the thermal plants under construction at Nanticoke and Lambton are located to supply the large prospective local demands and to take advantage of lower transportation costs. Coal movements to these plants will avoid the use of the Seaway facilities (and the Welland tolls).

- The water-borne movement of coal to the Hamilton steel mills reduces the cost of inputs into the steel production process and thereby allows a lower unit cost of production. It is likely that, given the limitations of competition in the steel industry, any increase in cost of inputs would be passed on to selected consumers in the form of prices. Thus without access to seaway facilities it is likely that the cost of delivered coal at Hamilton would in-

crease by about 70 cents per short ton. This figure represents the difference between the delivered price of coal from the Virginia coal fields moving via rail unit train and the delivered price from the same origin via rail/lake movement. (A saving of 35 cents per ton would approximate the price differential to Toronto.) The net benefit to the steel companies would be approximately \$2.2 million per year. If no seaway facilities were provided it is likely that the steel companies would recoup this increase in cost through price increases rather than absorb it in profits.

The reduction in transportation costs, both inbound and outbound, has undoubtedly influenced Stelco to locate a major steel mill on Lake Erie at Nanticoke. This facility will likely eliminate any increases in Hamilton's steel-making capacity and in fact may transfer some of the benefits obtained by this port to the Lake Erie region.

The accompanying table shows the inputs of the Canadian steel industry in tons. The significance of Hamilton and the Seaway can be seen when comparing the volume of coal and iron ore received at Hamilton with the inputs to the total industry.

Petroleum Trade

The movement of fuel oil and petroleum products is among the major commodity trades on the Great Lakes. These products are transferred from the refining centres on Lake Ontario and at Sarnia to consuming points throughout the lakes. In addition large volumes of oil and gasoline are shipped up-bound from Montreal through the St. Lawrence River canals to points on Lake Ontario and, to a minor extent, upper lake ports.

The location of major oil companies' refineries contributes to the shipment of petroleum products throughout the canal systems. For instance, the Shell refinery located at Oakville ships petroleum products

throughout the lakes to points such as Marathon, Port Colborne, Toronto and Hamilton; the Imperial Oil refinery at Montreal ships large volumes of petroleum products to ports on Lake Ontario and to a few ports on Lake Erie. In this case the Welland Canal acts as a barrier preventing further upbound shipments. This is due to the fact that Imperial Oil also operates a refinery at Sarnia which then supplies all ports upbound from the Welland Canal to the Lakehead.

The same situation prevails with the shipments of the Gulf Oil Company who operates refineries at both Montreal and Clarkson. Thus their supply for upper lake ports originates largely at Clarkson while the St. Lawrence River and Eastern Ontario ports are supplied by the Montreal refinery.

Other refineries located on the lakes are:

B.P. Oil Company, Montreal
Canadian Petrofina, Montreal
Texaco Canada, Port Credit
Sun Oil, Sarnia

All of these refineries use the St. Lawrence Seaway to some extent. However, it is unlikely that the benefits are passed on to the consumers as the oil companies usually charge comparable prices for the products within geographical areas, (this may not be the case with certain large purchases). The inter-company competition will establish the market price and the refinery price will reflect that market price less the transportation costs. Thus insofar as these costs are lower than otherwise due to the benefits of the St. Lawrence Seaway, the benefit is likely to remain with the oil companies in the form of increased profits.

GENERAL CARGO FLOWS ON THE GREAT LAKES

One of the many claims that has been made of the St. Lawrence Seaway is that it would open up the heartland of North America to foreign shipping; the Seaway would attract vessels from throughout the world to handle the imports and exports from this vast industrial belt. While the Seaway has technically permitted ocean vessels to travel from the mouth of the St. Lawrence to the head of the lakes, such movements have not occurred to any significant extent.

As shown in the following table the volume of general cargo moving on the Great Lakes is unimpressive. In 1966 the total volume of general cargo moving through the St. Lawrence system was approximately 5.9 million tons. This volume is indeed insigni-

ficant when compared with the tonnage of goods handled annually by the Canadian railways alone.

A closer examination of the general cargo flows suggests that the Great Lakes industrial region is a net importer of cargo as over 83 per cent of the general cargo movements are inbound movements from foreign ports. Thus there is an obvious imbalance of traffic flows which further accentuates the difficulties for foreign vessels plying the lakes in general cargo trades. It appears that there are two reasons for the heavy import imbalance. The first is that the movement of outbound export

material comes under severe competitive pressures from both overland modes and Atlantic Coast ports. This phenomenon is evidenced both in Canada and the U.S. Preferential rail rates and lower coastal harbour charges direct most of the export cargo away from the Great Lakes ports.

A separate study carried out in 1968 on this subject showed that there is substantial evidence to suggest that export cargoes are attracted to east coast ports because of preferential rail charges and lower terminal charges at the National Harbours Board ports. The conclusions of this report were:

Distribution of General Cargo Flows on the St. Lawrence Seaway

Origin/Destination	Upbound		Downbound	
	Tons	Per Cent	Tons	Per Cent
Montreal - Lake Ontario Section				
Canada to Ontario	24,074	0.5	—	—
Ontario to U.S.A.	—	—	7,454	0.7
Ontario to Foreign	—	—	405,659	38.4
Foreign to Ontario	125	0.0	—	—
U.S.A. to Ontario	651,173	13.3	—	—
Sub Total	675,372	13.8	413,113	39.1
Canada to U.S.A.	438,137	8.9	—	—
U.S.A. to Canada	—	—	2,262	0.2
U.S.A. to Foreign	—	—	641,362	60.7
Foreign to U.S.A.	3,792,501	77.3	—	—
Sub Total	4,230,638	86.2	643,624	60.9
Total	4,906,010	100.0	1,056,737	100.0
Welland Canal Section				
Ontario to Ontario	2,636	0.1	—	—
Ontario to U.S.A.	89,500	2.1	7,454	1.0
Ontario to Foreign	—	—	86,410	11.9
Foreign to Ontario	34,288	0.8	—	—
U.S.A. to Ontario	—	—	—	—
Sub Total	126,424	2.9	93,864	12.9
Canada to U.S.A.	—	—	—	—
U.S.A. to Canada	438,100	10.1	2,237	0.3
U.S.A. to Foreign	—	—	631,561	86.8
Foreign to U.S.A.	3,781,953	87.0	—	—
Sub Total	4,220,053	97.1	633,798	87.1
Total	4,346,477	100.0	727,662	100.0

Note: Due to rounding, some percentages do not add to total.

There are three causes that prevent the Port of Toronto from increasing its (export) traffic in any significant measure. These are:

- **Railway Pricing Policy:** Railway rates are established in favour of the National Harbours Board Ports. Incentive loadings and competitive rate tariffs are not published for Toronto and therefore, in general, the ton-mile cost to move commodities from inland points to Toronto are greater than for moving the same commodities through Montreal.

- **Terminal Charges:** The harbour charges are approximately five to seven times larger in Toronto than in Montreal harbour. This rate differential in itself will alter the flow of commodities; however, when this benefit is combined with the railway pricing structure, the one tends to accentuate the other. The fact that the railways have a 27 cents per cwt. terminal advantage in using Montreal, tends to protect them from their competitors. That is, the inland truckers not only have to overcome railway line haul rates but must overcome the difference in terminal charges.

- **Ocean Differential:** The ocean differentials between Toronto and Montreal will be determined by two basic causes — the first is the cost of moving inland by 335 miles and the second the amount of cargo available at the inland port. Ocean shipping is reputed to have a very low *available-ton-mile cargo cost*, which is significantly below that of railway ton-mile cargo cost. Therefore, this factor should technically work in favour of the inland ports. The problem seems to occur when the *available-cargo factor* is considered. That is, the lower the amount of cargo available the higher the *actual ton-mile cost* of the cargo moved becomes and the less attractive the harbour is for cargo movements. This cycle continues with the ocean differential increasing to reflect the diminishing amount of cargo available, thus further perpetuating the cycle.

It should be clear then that the more the first two factors considered above react together to give advantage to the Montreal port and therefore attract cargoes away from the inland ports, the greater the effect they have on this third factor, i.e., the ocean differential.

The second reason is that in a number of cases the general cargo imports are inputs to

a production process where the finished product is marketed nationally or within the North American market. This factor was particularly evident in the analysis of cargoes handled at Toronto.

It is particularly significant to note that while the total volume of Great Lakes general cargo is rather limited, the volume of such cargo handled in Ontario is even more discouraging. The above table shows that of the total import traffic through the St. Lawrence River system the volume destined for Ontario ports was only 13.8 per cent, almost all of this destined to the Port of Toronto. The percentage of traffic moving through the Welland Canal (less Lake Ontario traffic) destined for Ontario ports was only 2.9 per cent, the balance moving to U.S. Great Lakes ports. Thus excluding the ports of Toronto and (to some minor extent) Hamilton the total volume of general cargo imports to Ontario ports is approximately 34,000 tons, this meagre balance being destined to the ports of Sarnia, Sault Ste. Marie and Port Arthur.

Toronto harbour enjoys about 13 per cent of the foreign imports of general cargo moving on the Great Lakes, however the balance of Ontario's ports do not really participate in this traffic at all. The U.S. lake ports receive the balance of the import general cargoes (approximately 86 per cent).

The export pattern for general cargo has about the same characteristics as imports with the exception that Toronto is far more important in the total picture than was the case with import cargoes. The upper lakes ports in Ontario exported 86,000 tons of general cargo and while these same ports handled only 2.9 per cent of the inbound shipments through the Welland, their outbound shipments totalled 13.0 per cent. Toronto, while it exported far less than it imported, accounted for approximately 37 per cent of all general cargo exports on the lakes. This relatively senior position does not indicate a particularly good performance for the Port of Toronto but rather an extremely poor performance for the upper lakes U.S. ports such as Cleveland, Detroit, Toledo, Chicago and Milwaukee. (As indicated these ports suffer from heavy competition from overland modes.)

It can be safely concluded that with the exception of the ports of Toronto and Hamilton the general cargo flows stimulated by the St. Lawrence Seaway produce little or no benefits to Ontario centres.

The benefits from such cargo flows into the Ports of Toronto and Hamilton can be quantified by using an income multiplier of \$23 per ton of general cargo. It is well known that general cargo has a larger economic impact than does bulk cargo; it produces higher dock worker salaries and higher levels of investment to handle such material. A survey of the Port of Milwaukee produced the estimate of \$23 of "direct community income" for each ton of general cargo handled. While this estimate may not be directly applicable to the Ports of Toronto and Hamilton it can reasonably be assumed to approximate the correct figure. If a range of from \$10 - \$20 per ton is used as a multiplier then the annual benefits to these two ports is from 9.2 to 18.4 million dollars in direct community income generated from these cargoes. The balance of the ports in Ontario do not enjoy such benefits.

Containerization

In addition to looking at the past events as influenced by the St. Lawrence Seaway it may be advantageous to examine the future prospects of general cargo on the Seaway. It should be noted in the following that the handling of general cargo requires much more investment in facilities than does the movement of bulk cargoes. Therefore much of the Seaway's future in general cargo flows will be related to the level of investment in harbour facilities.

It is evident that tremendous changes are currently taking place in the methods of shipping and handling imports and exports. The containerized shipments are here to stay and thus this new technology is bound to destroy many of the old distribution patterns and rightfully so. However, there are certain characteristics of container services that will tend to perpetuate and even accelerate the present minority position of the Great Lakes ports relative to east coast ports.

Container services reduce the handling of individual units of cargo by grouping these together at origin (or some other consolidation point) and shipping a number of individual units as one large unit. This concept reduces handling costs and speeds the turn-around time of the vessels carrying the cargo. Both of these factors represent large reductions in the cost of moving cargo from port to port as well as through the port and, therefore, can reasonably be expected to reduce the export freight charges both for line

haul and for terminal portions of the expense. This will obviously aid in the expansion of world trade and should, particularly, provide an increased advantage to North American exporters as the European and Asian markets are brought closer in terms of cost of access.

While it is true that much of the Canadian export traffic is composed of bulk goods and, therefore, is not suitable for containerization, it is also true that through innovation more of the cargoes exported will become suitable for containerized handling. There can be little doubt that an efficient container port will act as a very attractive force for altering the current export distribution patterns.

An additional significant factor influencing the distribution of container services will be the decisions of ship owners (who have constructed container ships) on where to operate these ships. These decisions will be based upon the available terminal facilities at a port and the amount of (containerable) cargo that is available at that port. It is important to note that the amount of cargo that originates in the port's hinterland is not a significant aspect but rather the amount of cargo *available* at the port. In the case of Toronto, if the greater portion of the cargo originating in the port's hinterland is drained off to Montreal or other east coast ports, the cargo availability at this port will be greatly reduced and the port will be less attractive for ship owners looking for suitable ports from which to operate their container vessels.

Containerization is a very capital-intensive operation from both the ship owner's and the harbour authority's point of view. The container size alone demands that it be handled by mechanical equipment. The accommodation of container ships demands much more land area to handle the storage of the containers and large quay type sheds for breaking bulk and handling distribution of less than container load lots. Expensive transfer facilities must be provided if the intermodal aspects of the concept are to provide their full advantage to the shipper. Rail and truck connections to each finger pier are a must if fast efficient handling is to take place.

It can be seen then that vast amounts of capital are needed to equip a container port for efficient operation and without this capital investment it is unlikely that shipping companies, railroads, truckers and shippers will risk the return on their investment by

routing cargoes through an under-equipped harbour.

What does all this mean to Ontario and the ports of Toronto and possibly Hamilton? Simply this, that under the present harbour administration procedures and policies, Ontario harbours will pay considerably more for the capital needed to expand and construct harbour facilities capable of handling container vessels. The capital costs for the Port of Toronto are at least double and may range up to four times those of the Port of Montreal (1968 report on harbour charges and capital costs). It may even be unlikely that Toronto and Hamilton could provide container facilities under the present financial relative disadvantages that their respective managements are faced with. The Port of Montreal borrows or obtains capital on the account of the Federal Government, while the Port of Toronto must secure its capital on its own account. While Toronto will undoubtedly be forced to provide a container berth, it will be more costly and probably less competitive than corresponding facilities at the National Harbours Board ports.

A second factor of concern to Ontario is the relationship between National Harbours Board ports and the railroad charges. The movement to container shipments will force a recapitalization of all modes of transport if complete intermodal transportation is to be achieved. This means that both railways and truck lines will have to invest in expensive transfer facilities to handle these containers. The magnitude of the expense of converting facilities to handle the container is such that smaller trucking companies will not be willing to undertake this risk, unless they can anticipate an increasing share of the traffic. Under the current system of charges the railway rate structures prevent the truck carriers from competing on many of the export-import hauls and, therefore, it can be expected that when the railway terminal costs are reduced through containerized cargo handling, this condition will be further accentuated. The pace of this change will be increased by the capability of the financially secure railroad to undertake the investment and accept a greater risk than the truckers might be willing to undertake, with the possible exception of railway-owned trucking companies. However, it is questionable just how much competition for the railways could be expected from this source.

It now becomes even more important to be concerned with this aspect of transporta-

tion because, if under the conventional methods of shipping and cargo handling Ontario ports were at a decided disadvantage, they will be even more so under the forces of modern technology. As the cost of capital becomes an even greater factor in the determination of harbour costs, more cargo will be attracted away from Ontario ports. This will have an effect on the total inland distribution system as cargo routes will readjust to a new "competitive situation".

INVESTMENT IN THE SEAWAY

Investment in the Seaway ports is a very useful indicator of the development occurring in a port and of the growth rates expected in any one port. High investment indicates the potential for future growth and an expanding port, while low or negative investment can indicate a decrease in expectations.

Investment in Seaway ports and channels originates basically from three sources.

The St. Lawrence Seaway Authority is responsible for the Seaway channels, locks and canals, bridges, and remedial work. Since 1960 they have invested \$114,651,249 in these facilities. Seventy-nine per cent of this has gone into the building of channels, canals and locks.

All harbours in Ontario are the responsibility of the Federal Government. There are several harbours operating under a harbour commission generally composed of four to six commissioners responsible for the operation and financing of the port facilities. These include Hamilton, Toronto, Windsor, Oshawa and the Lakehead. There are also grain elevators at Prescott and Port Colborne which come under the jurisdiction of the National Harbours Board. All other public harbours are under the jurisdiction of the Department of Transport.

Public investment in Ontario ports, since the Seaway opened, totals \$88,250,465. Public harbours obtain funds from the Federal Treasury, commissioned harbours are financed by their Harbour Commissions, and the National Harbours Board finances its own installations through the federal government.

The pattern exhibited by public investment changes is closely linked to the growth patterns for all Great Lakes ports. The larger harbours, specifically Toronto, Hamilton and the Lakehead, have received 70.3 per cent of the public investment funds. This means that these three harbours have received over twice

Public Investment in Selected Ontario Seaway Ports

Port	Dollars											Total
	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	
Amherstburg	25,963	63,780	56,728	25,299	77,001	70,288				47,583		366,642
Blind River	31,614							56,965	72,421			161,000
Brockville	139,944											139,944
Collingwood		57,111	105,531		144,738		37,166	72,253	298,862	321,565		1,037,226
Cobourg	54,014	95,347	51,483	27,005	26,278	22,667	19,077	93,458	149,669	330,217	189,520	1,058,735
Cornwall				26,670	471,566	111,691	26,161		259,740	66,239		962,067
Goderich	100,327	124,340	98,560	21,702	33,911	283,840	587,156	271,878		18,956	185,003	1,725,673
Kingston		27,179		28,598			1,365	75,170	122,584	6,793	151,365	413,054
Kingsville	26,888	72,605			78,240		39,043	26,423		48,755	74,116	295,650
Leamington	392,456	265,453	148,777	97,930		231,439	19,499	75,131			152,399	1,383,084
Little Current	75,303			12,640				186,358	249,417	80,049		603,767
Owen Sound	79,620	91,899			187,743	105,112	21,101	228,567				714,042
Port Burwell		248,404	188,240	158,451	101,641	43,187	35,578	57,334	523,402	308,832	253,284	1,918,533
Parry Sound				34,493	146,264				133,421	227,392	18,146	555,716
Peleee Island				23,724	20,073	103,352	22,348					169,497
Port Colborne	109,283	24,768	106,891		11,803	123,362						
Port Dover			154,076	46,499	72,561			81	4,000	56,783	426,985	760,985
Port Hope	59,901	80,449	33,038	45,317	46,588	29,979	18,052	17,326	43,453		45,341	419,444
Port Maitland		73,880	35,103	136,052	50,823							295,858
Port Stanley												1,590,546
St. Catharines	178,194	112,630	123,931	89,255	77,401				261,175	374,855	266,689	524,408
Sarnia	38,850	98,856				199,648			248,638	63,763		623,384
Sault Ste. Marie			76,032	144,825		109,606	7,101	269,290	57,325	94,488		758,667
Port Credit	236,703	435,913	7,647	37,825	527,356	2,574,082	145,291		60,744			4,025,561
Kincardine					48,131					74,301	138,414	260,846
Meaford	119,655	160,261										279,916
Rondeau	28,349	77,870	260,134	42,212	413,357	47,998	123					870,043
Wallaceburg				143,916								143,916
Whitby	193,502	292,207	214,375	342,800	53,890	80,341	4,484	134,805	234,193			1,106,774
Prescott Elevator		302,421	26,319	28,284	14,543			7,651	107,114			825,390
Port Colborne Elevator				5,900	5,535							
Total (Port Colborne)	109,283	24,768	106,891	5,900	17,338	123,362		7,651	107,114			502,307
Oshawa		241,546	59,550	35,047	422,237	122,273	109,758	48,886	133,421	92,273	82,572	1,347,563
Sub-total												26,252,773
Toronto*												22,177,549
Hamilton												22,536,835
Port Arthur												17,283,308
Sub-total												61,997,692
TOTAL												88,250,465

Totals include some ports not shown here.

as much new investment as all other Seaway ports put together.

Nine additional ports each received from \$1 to 5 million added investment. These nine ports accounted for 17.2 per cent of the total investment change or \$15.1 million. Port Credit is the largest of this group, with just over \$4 million. The others in this classification, e.g., Cobourg, Leamington, Port Stanley, and Oshawa, all range between one and two million dollars added investment.

The classification under \$1 million contains 32 ports and accounts for only 12.6 per cent of the total investment. Most of these ports, for example, Cornwall, Little Current, Kingston, and Port Maitland range between \$100,000 and \$1 million. There are a number of smaller ports with under \$100,000 added investment. These include Belleville, Sombra, Spanish River and Gananoque.

As well as government-provided facilities, many private companies own wharves and equipment in Seaway harbours. Their investment in new plant and equipment is an important part of the total investment.

Private investment in new facilities is also concentrated in the larger ports. Grain elevator unloading facilities decreased in several of the Georgian Bay ports. Grain loading facilities at Port Arthur increased by 9.8 per cent from 1961-1967. This accounted for 89 per cent of the total Seaway increase. Ore loading docks, in this same period, showed a general increase in investment. A new dock at Fort William accounted for 75.2 per cent of this total new investment. The remaining 24.8 per cent was spread among several Georgian Bay ports. The total storage capacity of ore unloading docks increased by 200 per cent along the Seaway. This increase was due to a large investment in ore unloading facilities at Hamilton which increased this port's capacity by 833 per cent.

Coal unloading docks showed a net increase in storage capacity from 1961 of 21.5 per cent. This increase was created by the addition of large facilities at Courtright

(Sarnia) and Toronto and a compensating decrease in capacity in a number of small Ontario ports such as Cardinal, Chatham, Gananoque, Napanee and Prescott, where minor docks were abandoned.

CONCLUSIONS

The survey of Ontario Great Lakes ports has indicated the following characteristics are deterministic of the benefits provided by the St. Lawrence Seaway system:

- the cargo flows that received the major benefits are homogeneous products with a high density of movement and a relatively long length of haul, i.e., iron ore, grain, coal and petroleum;
- a small number of producers or industries reap the majority of benefits derived from the St. Lawrence Seaway, namely the U.S. and Canadian steel producers, iron ore companies in the Quebec Labrador area (largely U.S. controlled), U.S. coal mining companies, and the grain farming communities of both the Canadian and American prairies. While Ontario does participate in these trades their major benefits lie outside of Ontario;
- a small number of ports handle a majority of the cargo tonnage originating and terminating at Ontario harbours;
- a large percentage of the cargo loaded and unloaded in Ontario ports does not utilize any of the St. Lawrence Seaway facilities;
- only a very few Ontario ports, handling specialized cargoes, reap any significant benefits from the St. Lawrence Seaway;
- these major beneficiaries also experience the largest net increases in harbour investment;
- the smaller "minor" and "secondary" ports are engaged in the movement of local traffic, largely intra-lake movements, and do not participate in the benefits accruing from the Seaway facilities;

- the investment change in these smaller ports is extremely marginal and reflects the local character of the port and the use of smaller vessels (due in some cases to shallow harbour depth); much of this investment is related to a single plant and the facilities needed to handle its requirements.

Benefits to Ontario arise from:

- investment and employment in harbour facilities (major ports of Toronto, Hamilton and Port Arthur only);
- marginally lower prices for iron and steel products;
- marginally lower cost of thermal electric power generation;
- lower distribution costs for petroleum products which likely reflect very marginal price benefits to consumers.

It is perfectly clear then that after 10 years of operations the St. Lawrence Seaway has not been utilized to its full potential. It has not provided wide scale benefits to any but a few select areas. The Seaway does however represent a considerable asset to the Province and should be developed as such. The distribution of benefits suggests that any changes in the toll structure on the Welland Canal (particularly) and the St. Lawrence Seaway canals (generally) will be borne by a relatively few producers and much of the impact will fall outside of Ontario.

In addition, there are basic inequities in the administration of harbour facilities in Canada that tend to produce under-utilization of the Great Lakes facilities. (These inequities further affect the inland competition among all transportation modes.)

While upward revisions in the toll structure will surely not be welcomed there are other matters such as the level of investment in Great Lakes port facilities, the effects of national harbour policy, the rate of adoption of technological changes in transportation, that require consideration before this waterway can fully develop its potential.

Selected Economic Indicators

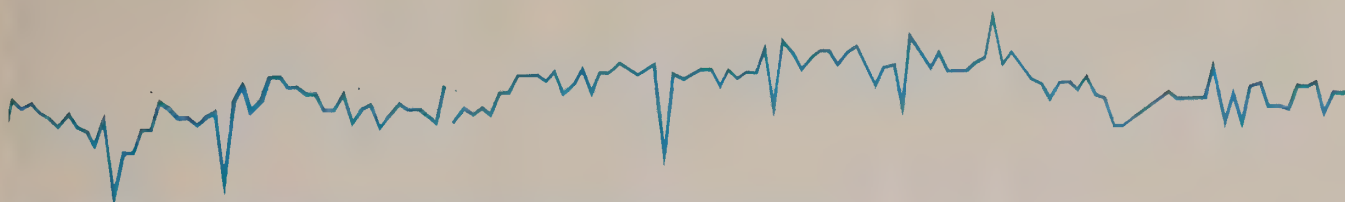
Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)

Number

Scale A

42
41
40
39



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

\$ Billion

Scale L1

4.0
3.5
3.0
2.5
2.0



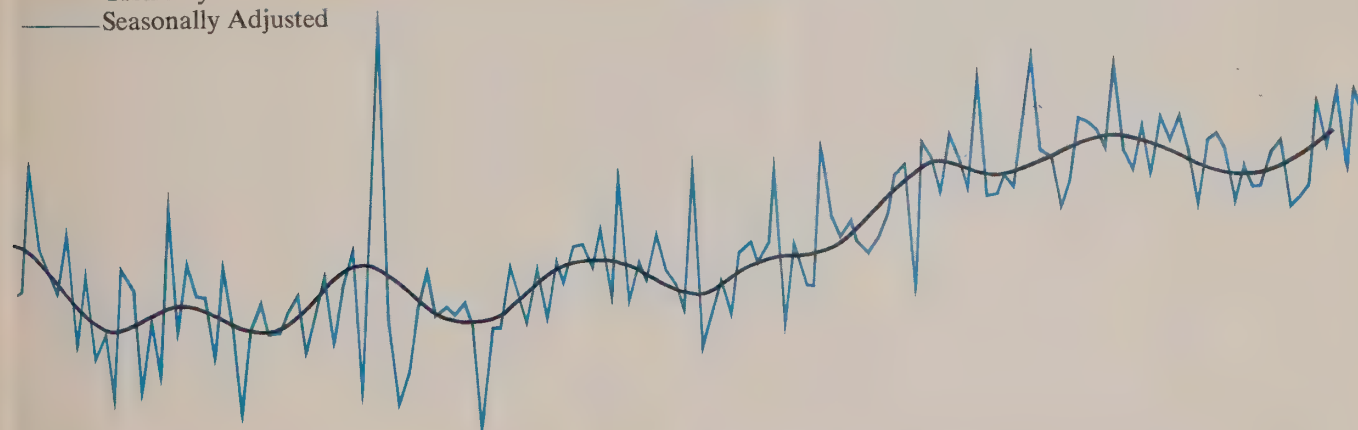
Business, Industrial and Engineering Construction Contracts, Ontario

\$ Million

Scale L2

— Trend Cycle
— Seasonally Adjusted

200
160
120
100
80
60
40



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

Thousand

Scale L2

— Quarterly
— Monthly

100
90
80
70
60
50
40



1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969

Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
Scale L1
_30
_25
_20
_15
_14
_13



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index
1956 =
100
Scale L2
_180
_160
_140
_120
_100



Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

— Current Dollars
— Constant (1957) Dollars

\$ Billion
Scale L1
_70
_60
_50
_40
_35



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Dollars
Scale L1
_3.00
_2.50
_2.00



1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969

Coincidental and Lagging Indicators

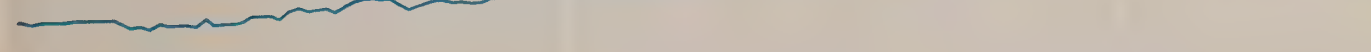
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent
Scale A
_7.0
_6.0
_5.0
_4.0
_3.0
_2.0
_1.0



Employment, Ontario (Seasonally Adjusted)

Million
Scale L1
_3.00
_2.50
_2.25
_2.00



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of Labour Force
Scale A
_1.0
_2.0
_3.0
_4.0
_5.0
_6.0



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
1961 =
100
Scale L2
_400
_300
_200
_100
_70
_50



1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969

Economic Indicators

Seasonally Adjusted

	1969												
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
Leading Indicators													
Average Weekly Hours Worked in Manufacturing	40.7	40.3	40.3	40.2	40.6	40.6	40.7	40.1	40.5	40.4	40.5		
New Orders in Manufacturing Industries ^c	3,360	3,349	3,377	3,420	3,601	3,581	3,577	3,430	3,518	3,693	3,542		
Business, Industrial and Engineering Construction Contracts	123.4	129.3	97.7	101.8	107.8	154.4	125.0	155.0	111.9	157.9	140.6		
Urban Housing Starts (Annual Rate)	63,200	60,800	61,900	63,900	48,900	73,400	83,500	98,200	80,800	109,700	102,400	79,900	45,300
Money Supply ^c	25,046	25,501	25,868	26,293	26,632	26,768	27,124	27,400	27,669	27,927	28,251	28,331	28,336
T.S.E. Industrial Index ^u	157.87	166.61	165.93	169.02	176.37	179.61	187.29	188.93	192.47	185.20	190.58	195.31	197.23
Business Failures ^u	50	46	49	28	36	46	48	34	57	59	55	58	48
Business Failures — Liabilities ^u	2.8	6.6	2.9	1.3	1.5	2.1	2.5	1.2	2.9	3.2	2.2	3.2	1.9
Coincidental and Lagging Indicators													
Gross National Product ^c (Annual Rate)		66,328			67,824			70,152				71,884	
Average Hourly Earnings in Manufacturing													
3-Month Treasury Bill Rate ^{c,u}	2.68	2.67	2.71	2.76	2.78	2.78	2.79	2.81	2.84	2.84	2.87		
Cheques Cashed in Clearing Centres ¹	6.95	6.56	6.03	5.48	5.66	5.57	5.66	6.24	6.38	6.43	6.58	6.80	6.74
Retail Trade	5,448	5,199	5,381	6,034	5,065	5,821	5,907	5,885	5,819	6,032	6,428		
Labour Force	779	804	840	835	850	851	862	853	879	886	862	866	
Employed	2,918	2,962	2,948	2,937	2,959	3,002	3,026	2,977	3,010	3,037	3,019	3,038	3,071
Unemployed	2,796	2,844	2,825	2,837	2,858	2,890	2,923	2,879	2,928	2,947	2,940	2,948	2,958
Unemployed as % of Labour Force	122	118	123	100	101	112	103	98	82	90	79	90	113
Wages and Salaries	4.2	4.0	4.2	3.4	3.4	3.7	3.4	3.3	2.7	3.0	2.6	3.0	3.7
Index of Industrial Employment	1,141	1,141	1,142	1,157	1,186	1,198	1,223	1,224	1,236	1,256	1,264		
	125.8	124.0	124.1	125.4	126.7	127.8	128.6	129.3	130.5	131.2	131.5	131.2	131.2
Index of Industrial Production ^c													
Total Manufacturing ^c	158.4	160.1	159.5	159.3	161.6	163.7	165.7	166.0	165.8	168.0	171.7	167.6	166.6
Non-Durables ^c	158.1	159.7	157.8	158.0	161.3	163.7	165.9	165.7	164.2	167.5	171.3	167.6	
Durables ^c	142.8	146.1	142.1	139.8	142.8	144.6	148.0	149.8	147.6	150.8	153.7	150.4	
Mining ^c	176.8	176.2	177.0	180.2	183.9	187.0	187.8	185.0	184.5	187.8	192.8	188.6	
Electric Power and Gas Utilities ^c	153.1	154.6	156.1	154.3	152.9	154.0	155.1	154.4	159.7	160.6	161.1	156.3	
Primary Energy Demand (Annual Rate)	169.1	172.1	179.9	179.0	177.5	178.5	179.7	186.7	189.5	184.3	184.7	186.2	
Exports (including re-exports) ^c	53.81	53.83	55.92	55.69	54.83	57.09	57.89	59.81	59.83	58.45			
Imports ^c	1,097.2	1,115.9	1,063.5	1,103.5	1,115.0	1,176.4	1,203.2	1,201.8	1,214.9	1,266.5	1,266.3	1,170.2	1,241.5
	992.2	962.7	927.3	963.0	1,092.1	1,127.2	1,084.3	1,106.0	1,105.6	1,194.8	1,180.7	1,167.1	1,155.5
Unclassified Indicators													
Foreign Exchange Reserves ^{c,u}	2,695	2,574	2,515	2,590	2,534	2,525	2,672	2,827	2,864	2,820	2,779	2,782	2,760
Industrial Materials Price Index ^{c,u}	252.0	253.0	253.4	254.2	253.4	256.8	257.1	258.9	261.4	263.5	264.1	267.7	274.5
Consumer Price Index ^{c,u}	119.3	119.7	120.4	120.7	121.1	121.4	121.9	122.3	122.6	122.6	123.2	124.6	124.9

^cStatistics for Canada.
^uNot seasonally adjusted.
¹Ontario less Toronto.

Ontario Economic Review Feature Articles

1963		1965		1967	
May	Canada and the Exchange Rate	Jan.	Oil and Natural Gas in Ontario	Jan.-Feb.	(Annual Review)
June	Portable Pensions — The Ontario Approach	Feb.	Ontario Regional Population Projections 1961-1986	Mar.-Apr.	Fertility and Population Growth in Ontario
July	Population Growth in Ontario	March	Significant Economic Changes in Agriculture	May-June	Soybeans in Ontario: Production, Utilization and Prospects
Aug.	Whither the Tourist Industry				
Sept.	Uranium and Nuclear Energy in Ontario	April	The Growth and Development of the Furniture Industry in Ontario	July-Aug.	Population Migration to and from Ontario
Oct.	The Structure and Concentration of Ontario Manufacturing and Its Relative Position in Canada	May	The Institutional Investor and the Securities Market	Sept.-Oct.	Towards a Theory of Provincial-Municipal Grants
Nov.	The Forest-Based Industries of the Northeastern Ontario Economic Region	June	The Growth and Development of the Motor Vehicle Industry in Ontario	Nov.-Dec.	Ontario's Demand for Industrial and Agricultural Machinery to 1976
Dec.	Economic Developments in the Department of Highways	July	Perspective on Recent Price Movements in Canada		
1964		Aug.	The Background of Federal Unconditional Grants to the Provinces 1867-1887	1968	
Jan.	(Annual Review)			Jan.-Feb.	The Economy in 1967
Feb.	Tobacco — Ontario's Major Cash Crop	Sept.	A Progress Report on the Economic Atlas of Ontario	Mar.-Apr.	Trade Liberalization and the Forest Industries
March	Canada's Requirements for New Business Machinery and Equipment from 1965 to 1975	Oct.	Educational Achievement Levels in Ontario	May-June	Potato Marketing in Ontario
April	Some Impressions Arising from the First Year of Operation of the Ontario Development Agency	Nov.	Concentration and Competition in Ontario's Fluid Milk Industry	July-Aug.	Budgetary Constraints to Policy Development
May	Ontario Labour Markets, 1953-1963	Dec.	(Annual Review)	Sept.-Oct.	The Pattern of Consumer Expenditure at Provincial and Regional Level
June	The Approach of Regional Analysis	1966		Nov.-Dec.	Development of Information Flows for Economic and Financial Policy Formulation
July	The Niagara Economic Region: Present Characteristics and Prospects of the Future	Jan.-Feb.	Opportunity through On-the-Job Training		
Aug.	The Development of Forestry Policy	March	The Development of Ontario's Textile Industry	1969	
Sept.	An Index of Economic Health for Ontario Counties and Districts	April	"The New Economics" and the Province of Ontario	Jan.-Feb.	Preliminary Population Projections for Ontario 1971-1991
Oct.	Preliminary Indexes of Production in Ontario	May-June	Progress Under the Automotive Free Trade Agreement: Some Comments	Mar.-Apr.	The Solemnization of an Institutional Marriage (or the joining of the 'Treasury' with 'Economics')
Nov.	A Pilot Study on Regional Labour Income in Ontario	July	Ontario's New Housing Program	May-June	The Reform of Taxation and Government Structure in Ontario
Dec.	The Growth and Development of Primary Iron and Steel in Ontario	Aug.-Sept.	Economic Education	July-Aug.	St. Lawrence Seaway — Impact on Ontario
		Oct.-Nov.	The Distribution of Personal Income in Ontario and the Ten Economic Regions		
		Dec.	Canada and the U.S. Guidelines		





Ontario Economic Review

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Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister



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The Ontario Economy

Air Pollution and the Utilization of Natural Gas in Automotive Vehicles

W. Fruehauf, *Energy Economist*
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

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H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 181, Ontario.

About the Review

The feature article for the September-October edition of the *Ontario Economic Review* presents excerpts from an article written by W. Fruehauf for inclusion in *Taschenbuch Erdgas*, 2nd Edition, West Germany, 1969. The primary objective of this article is to evaluate the use of liquefied natural gas as an alternative fuel for internal combustion engines to reduce air pollution.

Since a considerable degree of urban air pollution can be traced to the automobile it is becoming increasingly necessary that some method be found to abate these noxious emissions. The utilization of LNG and compressed natural gas as automotive fuel contributes significantly to the reduction of unburnt hydrocarbons, carbon monoxide and other pollutants while providing comparable operating characteristics to the use of gasoline.

Mr. Fruehauf is an economist with the Economic Planning Branch, Policy Planning Division of the Department of Treasury and Economics.

Indicator Charts, Pages 10-12

Fluctuations in aggregate economic activity – commonly used to define business cycles – do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate – because they relate to future rather than present production – are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 10-12 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used – 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) – only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

The most prominent features of the first half of 1969 were the continuation of the rapid expansion in business activity, particularly in the first quarter, a further significant rise in prices, and increasingly stronger anti-inflationary measures at the federal level in both Canada and the United States. These measures include: monetary tightening, fiscal restraint, increased income taxes and emphatic government declarations of war on spiralling wages and prices.

These intensified efforts have been prompted by the fact that consumer prices have risen at a faster rate this year than at any time since the current inflationary spiral began in 1965. In 1965 prices rose 2.5 per cent. In the subsequent two years consumer prices rose by an average of 3.7 per cent a year and last year they rose by 4.1 per cent. In the first six months of this year consumer prices have averaged 4.3 per cent above the first half of 1968 and as a result of a sharp increase from February to August, prices in the first eight months are 5.1 per cent above those at the same time last year. From May to June the consumer food index rose 2.2 per cent and between July and August it has risen an additional 1.4 per cent. Higher house prices and mortgage interest rates have pushed housing costs still higher, although rent increases have been more moderate than last year. Increases in pre-paid medical premiums and in doctors' and dentists' fees in a number of cities have raised health and personal care costs and higher taxes increased alcohol and tobacco prices in April.

Where last year tighter fiscal policy alone failed to abate the trend in prices, it is expected that a continuation of such a policy in conjunction with (since March) an extremely tight monetary policy should now produce the desired results.

On a regional basis, Ontario's price position so far remains relatively favourable. According to the consumer price index for regional cities in Canada increases in Toronto and Ottawa are generally below the national average.

The fact that the economy has been slow to react to restraining measures has prompted the United States to extend the income tax surcharge to the end of 1969. In Canada, the newly created Prices and Incomes Commission has asked for commitments of voluntary restraint from industry, labour and government. Government expenditures at the federal level, including both current and

**Per Cent Growth in Consumer Price Index
(Seven Months) 1969/68**

	Canada	Toronto	Ottawa
All Items	4.4	3.8	3.8
Housing	5.1	4.0	5.0
Food	4.0	3.5	2.2
Transportation	4.2	4.9	2.1
Clothing	2.7	2.4	3.1

capital, have increased at a slower pace than total expenditures in the economy during the first half of the year. In addition, there has been a major improvement in government revenues, since salary and wage levels in general have risen and are being taxed at higher rates. More recently the federal government has promised to limit expenditures by increasing efficiency and reducing public service employment. These developments lend tangible support to expectations of a budgetary surplus at the federal level in the current fiscal year. At the provincial and municipal levels of government, budget statements also indicate a swing away from large deficits towards surpluses during the current year.

The strong performance of personal consumption expenditures has been a key factor in the continuation of brisk economic activity.

While there has been a considerable increase in wages and salaries much of the additional income has been lost, not only by accelerating prices and more costly credit, but by substantial increases in taxes. The net result has been only a modest gain in personal disposable income, however, consumers have been trying to maintain their real standard of living and thus have reduced their rate of savings and incurred debt at an exceptionally high rate.

Credit, income and the reduction of savings now appear to be reaching their respective limits, consequently it is expected that the trend in consumer spending should move more closely in line with personal disposable income. The effect of this will probably show up most clearly in reduced outlays for durable goods. The incentives for personal saving have also become extremely attractive and should help to abate the expansionary influence of consumer spending as the year progresses.

Business capital investment has been another significant contributor to growth.

Despite indications of an impending business slowdown, Canadian corporations have stepped up 1969 capital spending plans from intentions reported at the beginning of the year.

The results of the recent DBS survey indicate that \$17,356 million of capital expenditures by all sectors of the Canadian economy are being planned for this year. This total represents an increase of 1.8 per cent over the total of \$17,046 million in intended capital outlays reported at the beginning of 1969. This new level for the year is 10.7 per cent higher than the preliminary estimates of \$15,678 million forecast in 1968.

The expected further increase in capital spending in the current year is reflected in the totals for both residential and non-residential types of construction but not in the estimates of purchases of new machinery and equipment. Expenditures on all new construction in 1969 are now expected to amount to \$11,384 million, about 3.0 per cent higher than the earlier estimate of \$11,034 million and about 12.0 per cent above the 1968 level of \$10,136 million. The latest total for machinery and equipment, at \$5,972 million, is only marginally lower than the first estimate of \$6,012 million and 8.0 per cent over the \$5,542 million for 1968. Capital spending plans by all three levels of government have been scaled down slightly from early-year intentions. Originally spending by governments and their supported institutions was expected to rise by nearly 8.0 per cent but now it is forecast to rise by approximately 7.0 per cent. The bulk of capital spending by government is at the provincial and municipal level.

On the basis of this most recent survey, Ontario's total investment will rise 16.3 per cent over 1968, instead of 15.5 per cent as indicated in the original January survey. This upward shift is the net effect of a small downward revision in government spending and an upward revision in business investment intentions. The following table indicates that manufacturing and housing intentions have been revised upward while the remaining non-governmental categories are down slightly. The chemical industry is responsible for much of the gain in manufacturing.

The motivation behind this upturn in capital investment is somewhat uncertain. Originally it was connected to the sharp upward swing in profits at the end of 1968 and to the absence of investment growth during the

Private and Public Investment in Ontario

	\$ Million		Per Cent Change	
	1968	1969 (Revised)	Original Survey	Mid-year Revision ¹
Primary Industries and Construction	480	481	1.1	0.2
Manufacturing	1,001	1,388	31.6	38.7
Utilities	1,019	1,196	17.5	17.4
Trade, Finance, Commercial Services	586	720	24.4	22.8
Housing	1,132	1,324	14.9	17.0
Institutional Services and Government Departments	1,305	1,314	3.4	0.7
Total	5,523	6,422	15.5	16.3

¹New annual per-cent gain based on summer survey.

Source: DBS and Department of Industry, Trade and Commerce.

past two years. In recent months however, "inflation psychosis" has assumed a more important role causing decision-makers to disregard the severe tightening of money markets. At present, indications are that even the selective postponement of depreciation allowances to capital investment in major Ontario centres has not produced the desired moderation and will simply add to escalating building costs.

However, the rising costs of financing, the severe limitations on amounts of funds available for new projects and the greater difficulties of self-financing as corporate profits after taxes level off, may lead to the prolonging of certain projects now under way and the deferral of others that might have been initiated in late 1969 and 1970.

Housing has been another major force in the economy's active pace, particularly in the first quarter. The increase in residential construction began in the fourth quarter of 1968. Ontario's housing starts advanced strongly under the stimulus of increased lending activity and special government funds. Time lags in the initiation of construction, particularly of large apartment projects, carried the rising number of starts over into early 1969. Urban housing starts in Ontario, seasonally adjusted at annual rates, rose from a low point of 60,100 units in the third quarter of 1968 to 84,200 in the fourth quarter. In the first quarter of 1969 the rate increased to 97,600 units, assuring sustained construction activity for at least the first half of the year.

In April residential starts dropped back to 79,900, followed by a substantial reduc-

tion in May to a seasonally adjusted level of 45,300. In June starts levelled off at 63,900 and have remained at approximately that level for the last three months.

The reason for the downturn is obvious — scarce capital with its accompanying high rates of interest. Because of this a series of changes have been made in NHA legislation, including the removal of the rate ceiling. However there is no indication that these efforts will alter the downward trend in housing.

Foreign trade has also played a prominent role in the growth of the economy this year. However, imports have set the pace in the first half of 1969, increasing 18.0 per cent over the total for the corresponding period in 1968 compared with an increase of 12.0 per cent for exports. As a result, the merchandise trade surplus has slipped to \$196 million in the first half of 1969 from \$502 million in the first half of last year.

As in 1968 the principal gains in dollar terms for both exports and imports have come from trade with the United States. Exports to the U.S. increased 17.0 per cent in the first six months of 1969 compared to the same period last year. Imports have also risen by 17.0 per cent. Higher exports to the U.S. accounted for almost all of the increase in total exports during the period. Similar to last year, the continued growth in shipments of motor vehicles and parts to the United States has made a significant contribution to the overall increase. Other commodities showing significant gains were lumber, wood

pulp and crude petroleum. Exports of wheat and flour have declined in the first six months reflecting the increased competition in world wheat markets.

On the import side the major source of Canadian imports is also the United States which once again emphasizes the degree of interrelationship between the two countries.

The increase in imports has caused a reduction in the merchandise trade surplus in the first half of this year. This situation combined with a continued large deficit on non-merchandise transactions has boosted the current account deficit to a level which has been estimated at more than twice that of the comparable 1968 period when the deficit was \$247 million.

However, the capital account in the balance of payments was in greater surplus than usual in the first half of 1969. With this larger surplus to counterbalance the increased current account deficit, the level of Canada's reserves of foreign exchange amounted to U.S. \$2,760 million at the end of June 1969. The main item in the large influx of funds to Canada during this period was higher portfolio investment by non-residents.

National Accounts

According to a revised calculation of national income and expenditure accounts released recently by the Dominion Bureau of Statistics Canada has had a stronger economic growth rate since 1950 than past figures have indicated. The latest estimates show an expansion at an annual average rate of 5.1 per cent between 1950 and 1968, not 4.5 per cent — based on 1961 constant dollars — as previously published.

The revised accounts will provide a comprehensive historical revision of the national income and expenditure accounts for the period 1926 to 1968 and will include much data not previously available, thus representing an important improvement on the previous set of accounts.

The revised figures reflect changes in the Canadian method of calculating national accounts to conform with a system recommended by the United Nations. They incorporate new information from the more recent census, new data from Department of National Revenue taxation returns and additional information from the Corporations and Labour Unions Returns Act. A number of changes in definitions are included in the

revised accounts to reflect more accurately income and expenditure allocations in the economy. For example, hospital expenditures are now included in government expenditures rather than consumer expenditures. Similarly hospital capital spending is now included as a portion of government capital expenditure rather than as an item of business gross fixed investment.

In another change designed to improve constant-dollar estimates — price deflators for construction expenditures now include allowances for changes in productivity and profit margins.

The revised national accounts reveal that in current dollars the gross national product has grown at an average annual rate of 8.0 per cent, rather than the earlier reported figure of 7.6 per cent. Thus, the new figure of gross national product in 1968 is \$71.45 billion, or \$4.08 billion more than the figure of \$67.36 billion released earlier by DBS. The new gross national product level is 6.1 per cent higher than the old figure.

The new data also show that the ratio of personal saving as a percentage of personal disposable income is not as high as previously estimated. In 1968 the ratio was 7.6 per cent, not 9.0 per cent as reported earlier. Actual personal saving was \$3,516 million, not \$4,048 million.

The growth rate for wages, salaries and supplementary labour income has also been underestimated. The annual rate of growth is now estimated at 8.7 per cent, not 8.1 per cent. Personal income in 1968 was therefore \$55.17 billion, not \$51.62 billion as originally stated. Corporation profits before taxes have also grown at a faster annual rate than previously reported. The new annual growth rate, covering the past 18 years, is estimated at 6.2 per cent, rather than the earlier reported 4.8 per cent.

The comprehensive report providing detailed coverage on the revised basis for the years 1926 to 1968 is to be published later this year.

"Perspective 1975"

The sixth annual review of the Economic Council of Canada predicts that the economic boom of the Sixties should continue through to 1975 producing a remarkable improvement in Canadian living standards and national prosperity. The potential gross national product for 1975 is estimated at \$100 billion in 1967 dollars, an increase of

\$34.4 billion over the 1967 level of \$65.6 billion. This would raise per capita output to \$4,324 from \$3,215 and would result in a 35.0 per cent increase in real living standards in the eight year period. The average growth rate from actual output in 1967 to potential output in 1975 is estimated at 5.5 per cent a year, compared to 5.1 per cent in the 1950-67 period and 6.0 per cent between 1961 and 1967. This growth rate would increase the annual volume of production by fifty per cent. Of the 5.5 per cent about two-thirds will be derived from increases in labour and capital, and one-third from productivity improvement.

One of the major sources of potential Canadian growth lies in the changing structure of the population, now that the large number of babies born after World War II have begun to reach maturity. Prior to 1967, the population was increasing at a rate of two per cent per annum while the labour force grew by 2.6 per cent annually. The Council calculates that in the 1967-1975 period population will increase by 1.7 per cent a year while the labour force will grow by 2.8 per cent — one of the highest growth rates among western industrialized nations. With an increasing proportion of the population available for productive work it will be necessary to expand business structures and equipment at a rate averaging over 5.5 per cent a year, compared with 4.6 per cent in the 1960-1967 period. In addition, the quality of the flow of new entrants to the labour force should rise as a result of higher educational achievements.

The council calculates that increased use of labour will contribute 2.5 per cent a year to real growth, compared with 2.4 per cent in 1960-1967, while the increased input of capital will contribute 1.2 per cent a year compared to 1.1 per cent.

The council continues to assume that the average annual rate of unemployment can be reduced to three per cent of the labour force. This goal assumes a reduction not only in seasonal swings but also in regional disparities that have caused the jobless rate to fall to inflationary levels in fast-growth areas while remaining high in other regions. It is extremely unlikely that regional disparities could be eliminated by 1975. Even the most successful regional development policies — not yet apparent — would take more than six years to produce the desired results.

The council also assumes — contrary to evidence in recent years — that an unemployment rate of three per cent will produce an average annual rate of price increase of two per cent for all prices and only 1.6 per cent for consumer prices in the 1967-1975 period. The consumer index rose 2.8 per cent in 1967, 4.1 per cent in 1968 and in August of this year was 5.1 per cent above the corresponding 1968 level. It is very unlikely that price increases in the remaining years will be small enough to produce a 1.6 per cent average for the entire period.

These estimates together with a 1.8 per cent average annual productivity improvement provide the 5.5 per cent annual increase in capacity required to bring potential output to \$100 billion by 1975. The capital investment needed to finance this growth is quite large — business fixed investment would have to rise from \$12.5 billion in 1967 to \$19.7 billion in 1975. However, the average annual increase of 5.9 per cent is in line with the historical trend and below the 8.1 per cent annual increase in the 1961-1967 period.

One of the most crucial assumptions underlying this strong performance is that the export market will remain strong. Exports provided the foundation of Canada's economic expansion in the sixties and the country could not hope for continuing strength if the large export industries were depressed.

The volume of consumer expenditure is expected to rise by more than fifty per cent between 1967 and 1975. The average annual increase is projected at 5.3 per cent. This would increase total consumer spending in Canada from \$39 billion in 1967 to \$59 billion (1967 prices) in 1975. Combined with the 1961-1967 high-growth period, the Council states that this would represent the longest, strongest sustained increase in consumer expenditure over the forty years for which statistics are available. On a per capita basis, consumer spending would rise by 3.6 per cent per annum to 1975, one of the most rapid rates of advance in the post-war period.

Nevertheless the consumer sector will decline in importance, partly because of a shift in some expenditures, such as on health care, from the private to the government sector. Consumers spent 64.3 per cent of gross national expenditure in 1961 and 59.4 per cent in 1967. By 1975, the council expects, consumers will account for only 56.6 per cent of all spending.

Air Pollution and the Utilization of Natural Gas in Automotive Vehicles

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Aspects of Environmental Air Pollution

In the course of his evolutionary process, man has been exposed to the forces of the natural environment. In many cases, he has successfully adapted to or coped with forces such as climate, meteorological conditions, predatory animals and microbiological predators. With increasing population and population density the man-made environment, to a large degree incapable of automatic renewal, is changing into a self-created enemy of man, in the form of air, water, soil, sonic and scenic pollution. Pollution results partly from greater intensity of use of the environment and the altered nature of wastes retarding or even prohibiting the natural process of environmental restoration.

Environmental air pollution constitutes a condition of the ambient air caused by the presence of substances, emitted by human activities, in forms and concentrations sufficient to interfere with comfort (nuisance effects of odors and soot), safety (decreased visibility), health (mainly respiratory illnesses), the full and undisturbed usage and value of property (corrosion and tarnish) as well as with animal life and vegetation.

Chemical interactions of compounds released to the atmosphere create through catalyses, condensation, oxidation, photo-chemical and free radical reactions, polymerisation and reduction new pollutants most of which have not been identified as yet. Atmospheric pollutants comprise solid and liquid particulate matter, in the forms of dust and aerosols, gases and vapours, in the forms of oxides, halides, organic and hydrogen sulfides, photo-chemical decomposition products, such as ozone, oxidants, peroxyacetyl nitrate and olefin, carbon monoxide, polycyclical hydrocarbons, aldehydes and other organic vapour contaminants, such as formaldehyde, acetaldehyde and acrolein. Carbon dioxide, playing an important part in the photosynthesis of green plants, is presently not regarded as a pollutant; however, with increasing releases from mainly combustion processes, carbon dioxide may become a pollutant in certain geographic locations and under certain conditions, since it is able to act as an atmospheric "blanket" causing abnormal temperature build-up.

A number of problem areas complicate pollution prevention and abatement measures. Lack of knowledge and problem-consciousness, inability to foresee the short- and long-term consequences of human activities, lack of individual respect and res-

pensibility for the preservation of common resources and the environment characterize a large portion of the so-called public opinion, behaviour and attitude toward air and other forms of pollution.

At the governmental level, comprehensive, coordinated and target-oriented pollution reduction and prevention is often overshadowed, retarded and sidetracked by fragmented interests, differences in opinion about jurisdictional competence, political ambitions and contentious opinions about the attraction, location and relocation of industry. In addition, a common belief that all or most of society's problems can be 'legislated away' is apt to discourage spontaneous action on the part of those responsible for air and other pollution by retarding or preventing their private efforts to combat pollution.

It is often disregarded that not only air quality standards but also the enforcement, the measurement of the effectiveness and remedies for the violation of such standards are of equal significance. In designing pollution prevention and abatement legislation and criteria, disagreement prevails as to the approach to be taken against pollution. By limiting the percentage content of pollution-causing substances in fuels, only short-term benefits, if any, can be expected since the mere growth in fuel consumption may compensate or even overcompensate for the effects of fuel specifications.

In view of imminent governmental anti-pollution measures, industry often expresses more concern about the preservation of the somewhat nebulous concept of free enterprise and competition, than about the prevention or abatement of air and other pollution. An unjustifiably narrow profit concept often tends to disregard socio-economic costs arising from environmental pollution.

Among scientists disagreement prevails as to the levels of tolerance to be applied to pollution prevention and abatement standards. Lacking consensus about the necessity of concentrating on those pollutants which should be monitored and related to health and other measures is another problem area tending to retard anti-pollution action. The influence of meteorological factors adversely affects the interpretation of air pollution data and the validity of monitorings. This problem is aggravated by the difficulty of identifying and quantifying environmental pollutants caused by human activities, by natural phenomena as well as by occupational and

personal pollution. Oxides of nitrogen and certain photo-chemical decomposition products are formed by electrical discharges of storms but also result from combustion processes. The present state of the art frequently does not allow for the establishment of a functional relationship between the use of certain substances, the pollutants released from such substances and the effects of such pollutants on man and his environment. The success and effectiveness of enforcing air quality criteria often cannot readily be identified and measured — if at all — which casts, in many instances, some doubt on the necessity, validity and justification of such criteria.

Consequently, the need prevails for research into the prevention or reduction of air pollution in order to establish effective, meaningful and economic anti-pollution policies and measures. Governmental and government-sponsored research may have to be re-oriented and directed towards fields where socio-economic benefits exceed and precede private profit motives as well as certain somewhat questionable achievements of so-called technological progress. Co-operation between the public and government is expected to enhance the success of anti-pollution actions. The response to governmental air-pollution prevention and abatement policies and measures has been far from unequivocal, however there are a number of encouraging developments in some industries reflecting interest and problem-consciousness. Recent developments in the field of air pollution caused by automotive vehicles have been investigated and serve as an expression of industrial participation in preventing and reducing such pollution.

AUTOMOTIVE VEHICLE FUELS OTHER THAN GASOLINE AND DIESEL FUEL

In a number of continental European countries, electric battery-powered and LPG (liquefied petroleum gases) fuelled delivery and pick-up trucks have been a common sight for a number of years. The North American interest in electric cars is reflected in research and development activities of auto producers and other interested parties. Favoured by the construction and operation of LNG facilities (for liquefaction, storage and vaporization) and by its chemical properties, natural gas, in both its liquefied and gaseous state, is developing into a potential automotive fuel. Marketing efforts to find additional applications for natural gas, the

construction of LNG facilities and the economic necessity of their optimum utilization are now meeting with pollution prevention and abatement policies and measures, and are creating a growing market potential for LNG ranging from its usage as a rocket fuel to its utilization in internal combustion engines of automotive vehicles.

At present, tests and investigations of various techno-economical aspects of LNG utilization in automotive vehicles are still continuing. Thus, the following presentation is merely to evaluate past experience of LNG utilization acquired on the basis of tests. In addition, mention is made of investigations of the use of compressed natural gas.

Utilization of LNG in Automotive Vehicles

Although the utilization of LNG pertains to heavy trucks and passenger cars, the following investigation is restricted to pick-up trucks and passenger cars.

The utilization of LNG in pick-up trucks and in passenger cars creates special requirements. For this purpose the gasoline-powered engines of the contemplated vehicles were modified, and instead of conventional fuel tanks specially designed LNG tanks were installed. Engine modifications included the following: each of the vehicles was equipped with a cylindrical thermo-insulated double tank (cryogenic tank) with an operating pressure of about 30 psig and a volume of 7.9 gallons¹ and 49.96 gallons respectively depending on the application. The inner tank consists of stainless 9 per cent nickel steel. The space between the inner and the carbon steel outer tank is filled with perlite. LNG stored at atmospheric pressure leaves the fuel tank and enters a heat-exchanging copper tube serving as a pre-vaporizer in which the temperature of the ambient air and the engine exhaust heat initiate the conversion of the natural gas from its liquid into the gaseous phase. A copper fuel pipe carries the pre-vaporized LNG into an air cooler for complete vaporization. A specially installed gas regulator controls the inflow of the natural gas carburetor for complete blending of natural gas with air during which evaporation losses are practically eliminated. The cooling energy set free by the vaporizing LNG sub-cools the combustion air and creates a fuel-combustion air mixture 15 per cent more dense than the comparable mixture in conventional gasoline operation.

Under normal storage conditions — 14.75 psia and -258°F, the vaporization of one gallon of LNG into 10.03986 cubic feet of vapor at -250°F absorbs 924.724 BTU per gallon vaporized. Raising the temperature of the above 10.03986 cubic feet from -250°F to 60°F will absorb another 653.311 BTU per gallon. Therefore, the total heat-sink capacity¹ of LNG is 1,578.035 BTU per gallon under the assumed conditions.

In order to adjust the valve action of the engine to natural gas — which has slower combustion characteristics than gasoline, and for a more complete combustion of the natural gas, a special camshaft was installed producing about 10-15 per cent more dwell² (compared with gasoline operation). A slight adjustment of the ignition time of the 6- and V-8 cylinder engines used is also required. Finally, the engine heads were milled in order to increase the compression ratio to between 10:1 and 14:1.

These were the actual modifications and installations. Depending on the vehicle, they required expenditures of up to U.S. \$500 (Cdn. \$1 = U.S. \$0.9275) of which the cryogenic tank accounted for some U.S. \$300. Economies of scale may reduce the required expenditures to about U.S. \$300 per vehicle.

The Use of Compressed Natural Gas in Pick-up Trucks and Passenger Cars

Similar to LNG, utilization of compressed natural gas is suited for pick-up trucks and passenger cars.

At the end of November 1968, the first test results became available regarding the utilization of compressed natural gas in conventional gasoline engines. Within a series of tests the following four vehicles were converted to dual-fuel operation: 1 pick-up truck (1968 model); 1 passenger car (1965 model) without exhaust control devices and 1 passenger car (1966 model) with exhaust control devices; an additional passenger car (1968 model) which could be fuelled with either LNG or gasoline.

In addition to the already existing gasoline tank, each of the first three cars was equipped with a natural gas pressure vessel with an operating pressure of about 2,000 psig. In the fourth vehicle, a 49.96 gallon LNG tank — as described above — was installed in addition to the conventional gasoline tank. The LNG tank holds at -258°F a natural gas equivalent of 5 MSCF³.

In the gasoline/natural gas-fuelled vehicles, compressed natural gas is released

from the pressure storage vessel during operation at moderate and frequently varying speeds in heavy traffic and during traffic congestion, when the emission of noxious engine-combustion products is particularly critical. When operated outside this critical phase, a switch located on the instrument panel shuts off the natural gas supply and opens the gasoline fuel pipe. During the operation on natural gas, gas is released from the pressurized storage vessel and flows in a high-pressure fuel pipe to a series of pressure-relief valves. From there natural gas flows through an "on-off" solenoid valve into the natural gas/air blender. The only essential modifications consist of the installation of the natural gas pressure tank, the solenoid valve and carburetor modifications.

OPERATING EXPERIENCE WITH LIQUEFIED AND GASEOUS NATURAL GAS AS ENGINE FUEL

The most important operating experience with LNG and compressed natural gas as automotive engine fuel is reflected in a significant reduction of the air-pollution-causing exhaust emissions.

Reduction of Air Pollution Through LNG

For the 1967 model passenger cars the respective government agencies have limited the emissions of unburnt hydrocarbons to 275 ppm¹ and of carbon monoxide to 1.5 per cent by volume. Compared to these standards the following values were reached during LNG operation:

	Unburnt Hydrocarbons	Carbon Monoxide
	ppm	per cent
Cold start	114.3	0.11
Warm start	109.0	0.12

The following end values were reached as a result of the indicated installations and modifications: 1) After installation of a natural gas carburetor and increase of the compression ratio — 175 ppm; 2) After installation of an air-cooling vaporizer — 160 ppm; 3) After installation of a special camshaft — 111-112 ppm. LNG operation and installation of a natural gas carburetor reduced the carbon monoxide of the exhaust from about 1.45 per cent to 0.2 per cent. Increase of the compression ratio reduced the carbon monoxide value to 0.11 per cent.

Apart from these compounds, the reactivity index was determined as an additional exhaust criterion. This index indicates the relative activity of the engine exhaust in its effect as origin of photochemical oxidation.

¹gallon = Imperial gallon (throughout this article).

¹ability of a solid, liquid or gaseous matter to absorb heat.

²torque.

³1,000 standard cubic feet.

¹parts per million.

The following was determined:

	Aromatics	Olefins	Paraffins	Reactivity Index ²
Passenger Car ¹	42	376	292	710
Pick-up Truck	84	344	258	686

¹1968 model, without engine exhaust modifications.

²Gasoline engines without exhaust-control devices reached reactivity indexes as high as 4,535.

Exhaust Levels for 1968 Model Vehicles

	Unburnt Hydrocarbons		Carbon Monoxide	
	Beginning of Test	After 42,000 miles	Beginning of Test	After 42,000 miles
Gasoline	225 ppm	240 ppm	1.0 per cent	1.2 per cent
LNG	118 ppm	93 ppm	0.17 per cent	0.21 per cent

The values given for LNG operation appear to be representative for the respective companies performing the tests. Through further modifications of the respective vehicles it appears possible to reach the exhaust values given previously.

The LNG used in these tests has been — with the exception of nitrogen — purged of the following trace elements prior to liquefaction: acid gases; carbon dioxide; heavy hydrocarbons (including propane and butane); sulphur and water. Thereafter, the LNG consisted of about 92 per cent methane, 6-7 per cent ethane and 1 per cent nitrogen.

The exhaust emissions mentioned should indicate the potential of the use of LNG as automotive fuel.

REDUCTION OF AIR POLLUTION THROUGH COMPRESSED NATURAL GAS

Similar to the operation with LNG, compressed natural gas utilized as engine fuel offers a significant advantage in reducing the release of noxious vehicle emissions.

After continuous tests, the following results were obtained for the 1965 and 1968 model cars:

The following table indicates the percentage reduction of the exhaust levels achieved by the utilization of compressed natural gas as compared to gasoline:

	Model	
	1965	1968
	Per Cent	Per Cent
Carbon Monoxide	96.8	80.0
Olefins	95.4	92.0
Other unburnt hydrocarbons	77.7	28.3
Total unburnt hydrocarbons	83.9	60.2
Nitrogen Oxides	74.4	48.2

Carbon monoxide combines with blood hemoglobin some 210 times faster than oxygen, thereby reducing the blood's oxygen-carrying capability and possibly leading to autoxia. Internal combustion engines are regarded as the main source of carbon monoxide pollution.

Among the unburnt hydrocarbons, olefins contribute most strongly to the formation of photochemical smog. Some of the polycyclical hydrocarbons have carcinogenic properties and contribute to smog formation. Formaldehyde, acetaldehyde, acrolein and

other lower aldehydes are produced through incomplete oxidation of motor fuel and lubricating oil and contribute to eye irritation.

Oxides of nitrogen penetrate the peripheral airways and cause irritation. They also contribute to reduced visibility and to corrosion and other forms of deterioration of a number of materials. The reduction of the oxides of nitrogen belonging to the most noxious engine-exhaust compounds is an important task.

In addition to exhaust emissions from internal combustion engines, smog-forming pollutants also result from evaporative emissions of gasoline. By lowering the volatility of gasoline, such evaporative emissions can be reduced, however, only at the expense of increasing exhaust emissions. Instead of changing the volatility, the composition of gasoline could be altered in order to reduce evaporative emissions without inducing an increase in exhaust emissions.

COMPARISON OF THE OPERATING COSTS BETWEEN GASOLINE AND LIQUEFIED AND COMPRESSED NATURAL GAS

In addition to the reduction of engine exhaust emissions, a relevant contribution of natural gas as automotive fuel can be seen in the reduction of fuel costs as compared to the utilization of gasoline. Compared to gasoline operation, power development and acceleration are similar in the case of LNG operation. The lower specific gravity of LNG — compared to gasoline — compensates for the additional weight of the LNG tank. Similarly, the low specific weight of compressed natural gas causes a certain reduction of the weight increase resulting from the installation of a second fuel tank.

Gasoline Versus LNG

During continuous operation at various test speeds averaging 40 mph, gasoline consumption was 0.047447 gallons per mile and LNG consumption 0.066348 gallons per mile. The last figure does not include boil-off losses of some two per cent per 24 hours of the tank content for idling vehicles. In the case of idling, the total tank content of 7.91046 gallons would evaporate in about 1,200 hours. This rate of loss was experienced by one company utilizing LNG. On the contrary, another company stated that no boil-off occurs during a night's stand-still of the dual-fuelled vehicle (LNG/gasoline) as

	Compressed Natural Gas		Air Quality Standards	Gasoline	
	Model		Model	Model	
	1965	1968	1968	1965	1968
Carbon Monoxide	0.14%	0.13%	1.5%	4.40%	1.30%
Olefins	13.3 ppm	8.8 ppm	—	289.0 ppm	110.5 ppm
Other unburnt hydrocarbons	119.7 ppm	79.2 ppm	—	536.0 ppm	110.5 ppm
Total unburnt hydrocarbons	133.0 ppm	88.0 ppm	275 ppm	825.0 ppm	221.0 ppm
Nitrogen Oxides	337.0 ppm	554.0 ppm	—	1,315.0 ppm	1,070.0 ppm

the large cryogenic tank (49.9608 gallons) is capable of withstanding the rise in pressure caused by LNG vaporizing in the tank during the vehicle's down-time. The LNG fuel line is designed so that, when the internal tank pressure rises above normal atmospheric pressure due to heat leaking into the tank, the vaporized LNG can be used for initial engine startup. After the combustion of the accumulated gas vapours the internal tank pressure — increased by heat penetration — decreases again to atmospheric pressure.

In the case of the first-mentioned company, vehicle stand-still caused a two per cent loss of the tank volume during a 24-hour period. If a daily vehicle utilization of one hour is assumed, during which boil-off losses do not occur, then instead of 0.158209 gallons per 24 hours, only 0.151616 gallons per 24 hours would be lost. At LNG cost of U.S. 10.20799 cents per gallon and at a daily driving distance of 40 miles a boil-off cost of 0.03869 cents per mile will be incurred. At the LNG cost and daily driving distance referred to, the straight fuel cost amounts to 0.67728 cents per mile. In comparison with this cost, gasoline cost excluding taxes amounts to 27.50153 cents per gallon and the corresponding comparable straight gasoline cost is 1.30486 cents per mile.

If vehicle modification expenditures of U.S. \$500 per vehicle are assumed, a vehicle lifetime of five years and interest of six per cent per annum, then, at straight-line depreciation, the annual amortization cost is U.S. \$118.767, i.e. 0.81340 cents per mile. It is assumed that the capital costs of the vehicles fuelled with LNG and gasoline are otherwise equal. Therefore the mileage cost for LNG operation amounts to:

U.S. cents per mile	
0.81340	Amortization cost
0.67728	Straight LNG fuel costs
0.03869	Boil-off cost
1.52937	Total operating cost

In comparison, gasoline cost exclusive of taxes is 1.30486 cents per mile.

At a reduction of the vehicle modification cost from U.S. \$500 to U.S. \$300 per vehicle, amortization cost for LNG operation is 0.48804 cents per mile, and total operating cost amounts to 1.20401 cents per mile. In both instances, lower LNG maintenance costs (compared to gasoline operation) were not considered.

The LNG production cost in Southern California amounts to:

NG purchasing cost	32.6 cents per MCF
Liquefaction cost	16.3 cents per MCF
Storage cost	+ 8.6 cents per MCF
Total cost	57.5 cents per MCF

Volume discounts can reduce the LNG cost to 7.20564 cents per gallon and the total operating cost under the assumed conditions to 0.99343 cents per mile.

Gasoline Versus Compressed Natural Gas

Tests of dual-fuelled vehicles (gasoline and compressed natural gas) resulted in an average natural gas consumption of 6.9444 cu. ft. per mile. At natural gas cost (low volume consumers) of U.S. 75 cents per MCF, straight natural gas fuel cost was 0.5208 cents per mile. Operation with gasoline required 0.06122 gallons per mile, the cost of which exclusive of taxes amounted to 27.50153 cents per gallon or 1.6836 cents per mile.

At vehicle-modification expenditures of U.S. \$300 required to convert each of the contemplated vehicles to dual-fuel operation

(reduction to at least \$220 per vehicle is possible), at a lifetime of five years, an interest rate of six per cent per annum, straight-line depreciation and at a daily driving distance of 40 miles, the average specific amortization cost is 0.48804 cents per mile. At modification expenditures of U.S. \$220 per vehicle, the average specific amortization cost would be 0.35788 cents per mile. Therefore, the total operating costs (fuel plus amortization) amounts to 1.00884 cents per mile and 0.87868 cents per mile respectively. For the above comparison, the lower engine performance for natural gas operation (compared with gasoline) has not been considered.

Compared with the calculated operating cost of natural gas operation, the cost of gasoline exclusive of taxes amounts to 1.6836 cents per mile. Therefore, depending on the magnitude of the vehicle-modification expenditures, the use of natural gas provides operating cost savings of 0.67476 cents per mile and 0.80492 cents per mile respectively. Increased driving distances per day reduce the specific amortization cost correspondingly.

CONCLUSIONS

In summary, the calculated values from the comparison of operating costs are presented.

Operating Costs for the Utilization of LNG and Gasoline

	No Modification Expenditures	Modification Expenditures of	
		U.S. \$500	U.S. \$300
Gasoline	1.30486 cents per mile		
LNG		1.52937 cents per mile	1.120401 cents per mile
Difference		−0.22451 cents per mile	+0.184459 cents per mile

Operating Costs for the Alternate Utilization of Compressed Natural Gas and Gasoline

	No Applicable Modification Expenditures	Modification Expenditures of	
		U.S. \$300	U.S. \$220
Gasoline	1.6836 cents per mile		
NG		1.00884 cents per mile	0.87868 cents per mile
Difference		+0.67476 cents per mile	+0.80492 cents per mile

+ = Calculated savings compared with gasoline utilization.

− = Calculated additional costs compared with gasoline utilization.

As mentioned, the most significant contribution of the use of LNG and compressed natural gas as automotive fuel compared to gasoline can be seen in the large reduction of air pollution caused by automotive vehicle emissions in the form of unburnt hydrocarbons, carbon monoxide and nitrogen oxides. The utilization of LNG in modified gasoline and diesel engines offers operating characteristics comparable to the use of gasoline or diesel oil. This has been demonstrated in road and dynamometric tests. Instead of converted gasoline or diesel engines, specially designed LNG engines are capable of increasing the advantages offered by LNG utilization. In addition, with large-scale production of cryogenic tanks and improved thermo-insulation of these tanks it is possible to reduce the vehicle capital cost in the case of LNG utilization. The cleanliness of LNG reduces cylinder impurities and lessens the necessity for frequent oil changes and spark plug cleaning.

The combustion of compressed natural gas in dual-fuel systems as in the case of LNG, reduces the costs of oil changes and additional maintenance compared to gasoline utilization. In addition, natural gas offers fuel cost savings. Compared to gasoline the favourable combustion characteristics of natural gas reduce the formation of oil slurry and the dilution of engine oil. Moreover, natural gas does not act as an oil solvent when passing the cylinder rings (especially when the engine is idling).

Compared to gasoline, combustion of natural gas offers a quieter engine run, as natural gas enters the carburetor in gaseous state and is continuously and uniformly mixed with air. Contrary to natural gas utilization, gasoline does not always completely vaporize and consequently does not burn evenly.

An additional advantage results from the relatively high octane rating of about 130 for natural gas without the addition of tetraethyl lead or other additives. This eliminates the emission of lead compounds into the atmosphere and leading of the engines.

Technical Problems

Particular technical problems arise from the use of LNG in automotive vehicles through the increase in fuel tank pressure caused by vaporizing LNG, to be more exact, methane whose boiling point is lower than that of ethane, propane and butane. One of the experiments reported daily boil-off losses of

about two per cent of the LNG tank volume. In the case of the trucks, improved tank installation and fuel-system design have resulted in boil-off losses being negligible for up to 2-3 days during vehicle stand-still. Another company indicated that for a stand-still period of approximately 10 hours LNG losses did not occur at all. During extended periods of vehicle down-time, the installed pressure-relief valves will cause significant LNG losses. Therefore, it is advantageous to realize the highest possible vehicle utilization per tank fill.

The presence of heavy hydrocarbons having a higher boiling point than methane, particularly ethane, propane and butane (amounting to as much as 5-11 per cent of LNG) can cause serious problems. If LNG is exclusively or predominantly withdrawn from the upper part of the fuel tank, then the engine burns essentially methane. After several refills heavy hydrocarbons can concentrate in the lower part of the fuel tank. If such heavy LNG compounds reach the engine cylinders, a detonation in the cylinder heads is likely to occur. Therefore, an LNG anti-enrichment system is recommended which withdraws LNG from the lower part of the tank and which uses the latent heat of vaporization of the LNG for the compensation of the heat conduction into the tank.

Compared to liquid engine fuels (e.g. gasoline, diesel oil and kerosene) LNG has a lower heating value per volume unit. Compared to a gross heating value of 153,726 BTU per gallon for gasoline, LNG has 103,381 BTU per gallon.

In dual-fuel systems, the utilization of compressed natural gas causes a reduction in power development compared with gasoline. The installation of a natural gas pressure storage vessel in addition to the gasoline tank reduces the pay load of the vehicle and the available storage area. This, in turn, is reflected in the specific fuel consumption of the respective vehicles.

In most cases, refuelling of dual-fuel systems has to take place at separate locations (retail pump outlets and natural gas distributors). This can result in additional fuel costs and can cause a more or less strong dependence on the availability of natural gas. In case of LNG utilization, the availability does represent an even more serious bottleneck. Problems of safety and reliability of LNG and natural gas utilization arise in the case of vehicle collisions.

In any case, the problems referred to will strongly prohibit a massive penetration of the gasoline and diesel oil markets by LNG and natural gas in the near future. However it is relevant that LNG and compressed natural gas as automotive fuels are capable of materially reducing air pollution caused by automotive vehicle emissions. This inherent objective capability may very well stimulate the efforts of the petroleum and vehicle industry to reduce air pollution caused by engine emissions.

OUTLOOK

LNG and compressed natural gas as engine fuels may find a certain market potential in industrial and commercial applications, where companies operate a relatively large fleet of vehicles which in turn have a high degree of vehicle utilization. Examples are: urban transportation, taxis, mining, road-construction and trucking operations.

Second and subsequent generations of supersonic airplanes may turn out to be another potential LNG market. If the problems of space utilization, safety aspects and vaporization losses (after take-off) can be solved satisfactorily LNG could substantially reduce pollution caused by airplanes. It has been stated that during take-off, a four-engine jet releases pollutants equivalent to those emitted by some 900 passenger cars. Yet, air pollution caused by air traffic has not been given adequate attention compared to pollution caused by automotive vehicles. Air traffic pollution cannot or only to a small extent be influenced by provincial governments. Provincial anti-air pollution policies and measures remain discriminatory and to some extent ineffective, so long as the federal government fails to reduce aircraft pollution.

Additional LNG utilization also may occur in gas turbine trains. The heat-sink capacity of LNG during vaporization can be used for air conditioning of passenger cars, for cooling of freight cars and for subcooling of the turbine combustion air. Finally, switching locomotives, waterborne carriers, agricultural machines, fork lift trucks, emergency power generators, fuel cells and storage facilities of gas utilities may become LNG consumers.

Anti-air pollution policies and measures are expected to benefit from the developments described. It would appear that governments would be well advised to co-operate closely with private citizens, corporations, and other governments in order to establish

effective, realistic, coordinated and comprehensive anti-pollution policies and measures observing socio-economic benefit-cost aspects. To prevent pollution seems to be more

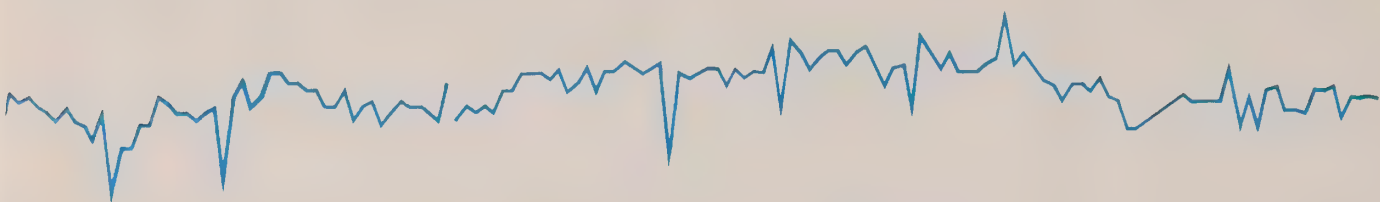
desirable than to abate pollution which has already occurred. In the field of air pollution, dispersion of pollutants at relatively high altitudes appears to offer only short-term relief,

as dispersion does not prevent air pollution but merely distributes pollutants more finely and over a larger geographical area than under undispersed conditions.

Selected Economic Indicators

Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



Number

Scale A

New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

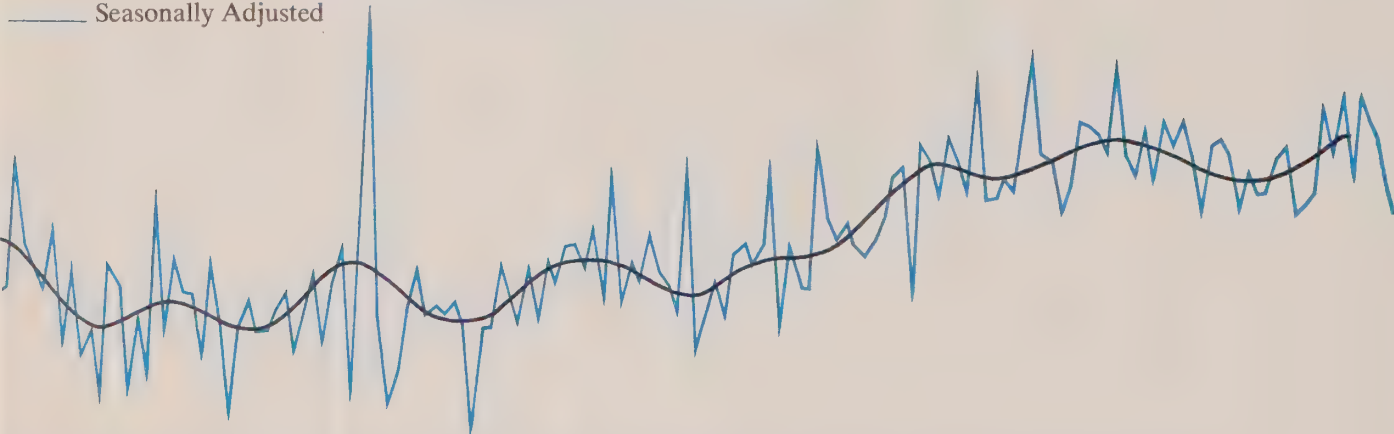


\$ Billion

Scale L1

Business, Industrial and Engineering Construction Contracts, Ontario

— Trend Cycle
— Seasonally Adjusted



\$ Million

Scale L2

Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

— Quarterly
— Monthly



Thousand

Scale L2

1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969

Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
 _30
 _25
 _20
 _15
 _14
 _13

Scale L1



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index
 1956 =
 100
 _180
 _160
 _140
 _120
 _100

Scale L2



Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

— Current Dollars
 — Constant (1957) Dollars

\$ Billion
 _70
 _60
 _50
 _40
 _35

Scale L1



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Dollars
 _3.00
 _2.50
 _2.00

Scale L1



1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969

Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent

Scale A



Employment, Ontario (Seasonally Adjusted)

Million

Scale L1



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of Labour Force

Scale A



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
1961 =
100

Scale L2



1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969

Economic Indicators

Seasonally Adjusted

	1969													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Leading Indicators														
Average Weekly Hours Worked in Manufacturing	40.3	40.3	40.2	40.6	40.6	40.7	40.1	40.5	40.4	40.5	40.1	40.2	40.2	
New Orders in Manufacturing Industries ^c	3,349	3,377	3,420	3,601	3,581	3,577	3,430	3,518	3,697	3,575	3,539	3,564	3,664	
Business, Industrial and Engineering Construction Contracts	129.3	97.7	101.8	107.8	154.4	125.0	155.0	111.9	157.9	140.6	120.9	110.5	97.7	
Urban Housing Starts (Annual Rate)	60,800	61,900	63,900	48,900	73,400	83,500	98,200	80,800	109,700	102,400	79,900	45,300	63,900	60,800
Money Supply ^c	25,501	25,868	26,293	26,632	26,768	27,124	27,400	27,669	27,927	28,251	28,331	28,336	28,638	28,324
T.S.E. Industrial Index ^u	166.61	165.93	169.02	176.37	179.61	187.29	188.93	192.47	185.20	190.58	195.31	197.23	177.34	168.65
Business Failures ^u	46	49	28	36	46	48	34	57	59	55	58	48	35	
Business Failures — Liabilities ^u	6.6	2.9	1.3	1.5	2.1	2.5	1.2	2.9	3.2	2.2	3.2	1.9	2.0	
Coincidental and Lagging Indicators														
Gross National Product ^c (Annual Rate)	66,328			67,824			70,152			71,884				
Average Hourly Earnings in Manufacturing	2.67	2.71	2.76	2.78	2.78	2.79	2.81	2.84	2.84	2.88	2.87	2.89		
3-Month Treasury Bill Rate ^{c,u}	6.56	6.03	5.48	5.66	5.57	5.66	6.24	6.38	6.43	6.58	6.80	6.74	7.13	7.62
Cheques Cashed in Clearing Centres ¹	5,199	5,381	6,034	5,065	5,821	5,907	5,885	5,698	5,981	6,478	6,146	6,156	6,127	
Retail Trade	804	840	835	850	851	862	853	879	886	862	866	866	875	884
Labour Force	2,962	2,948	2,937	2,959	3,002	3,026	2,977	3,010	3,037	3,019	3,038	3,071	3,035	3,028
Employed	2,844	2,825	2,837	2,858	2,890	2,923	2,879	2,928	2,947	2,940	2,948	2,958	2,926	2,935
Unemployed	118	123	100	101	112	103	98	82	90	79	90	113	109	93
Unemployed as % of Labour Force	4.0	4.2	3.4	3.4	3.7	3.4	3.3	2.7	3.0	2.6	3.0	3.7	3.6	3.1
Wages and Salaries	1,141	1,142	1,157	1,186	1,198	1,223	1,224	1,239	1,256	1,263	1,270	1,288	1,295	
Index of Industrial Employment	124.0	124.1	125.4	126.7	127.8	128.6	129.3	130.5	131.2	131.5	131.4	131.4	131.0	129.9
Index of Industrial Production ^c	160.1	159.5	159.3	161.6	163.7	165.7	166.0	165.8	168.0	171.3	167.7	167.0	167.1	166.8
Total Manufacturing ^c	159.7	157.8	158.0	161.3	163.7	165.9	165.7	164.2	167.5	171.3	167.3	168.6	169.1	169.1
Non-Durables ^c	146.1	142.1	139.8	142.8	144.6	148.0	149.8	147.6	150.8	153.6	150.2	150.6	151.1	151.1
Durables ^c	176.2	177.0	180.2	183.9	187.0	187.8	185.0	184.5	187.8	192.8	188.1	190.7	191.0	191.2
Mining ^c	154.6	156.1	154.3	152.9	154.0	155.1	154.4	159.7	160.6	162.1	157.4	145.5	142.5	139.0
Electric Power and Gas Utilities ^c	172.1	179.9	179.0	177.5	178.5	179.7	186.7	189.5	184.3	184.7	186.2	186.6	187.1	189.0
Primary Energy Demand (Annual Rate)	53.83	55.92	55.69	54.83	57.09	57.89	59.81	59.83	58.45	59.49	59.20	58.54	59.12	60.28
Exports (including re-exports) ^c	1,115.9	1,063.5	1,103.5	1,115.0	1,176.4	1,203.2	1,201.8	1,214.9	1,266.5	1,266.3	1,194.2	1,233.6	1,211.9	1,139.2
Imports ^c	962.7	927.3	963.0	1,092.1	1,127.2	1,084.3	1,106.0	1,105.6	1,194.8	1,180.7	1,154.1	1,177.3	1,215.2	1,123.2
Unclassified Indicators														
Foreign Exchange Reserves ^{c,u}	2,574	2,515	2,590	2,534	2,525	2,672	2,827	2,864	2,820	2,779	2,782	2,760	2,623	2,565
Industrial Materials Price Index ^{c,u}	253.0	253.4	254.2	253.4	256.8	257.1	258.9	261.4	263.5	264.1	267.7	271.8	270.6	270.5
Consumer Price Index ^{c,u}	119.7	120.4	120.7	121.1	121.4	121.9	122.3	122.6	122.6	123.2	124.6	124.9	125.9	126.4

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.





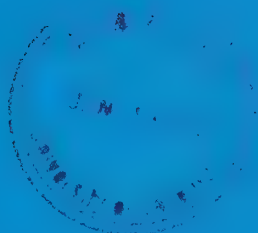
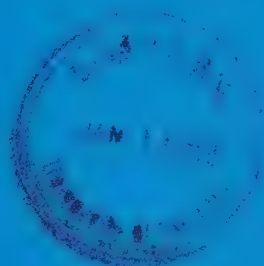
Ontario Economic Review

Nov/Dec 1969
Volume 7, Number 6

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister



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The Ontario Economy

An Analysis of Population Growth Trends in Ontario

R. Kogler, Economist,
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 181, Ontario.

About the Review

The feature article for the November/December edition of the *Ontario Economic Review* presents an analysis of population growth trends in the Economic Regions and Counties of Ontario since the turn of the century in general and from 1921 to 1966 in particular.

Population growth has always been a matter of great interest in Ontario, as elsewhere, since the demand for social capital and private capital investment is dependent to a large extent on the size of the population. In the past, investment plans have usually been based on the assumption that current trends would continue. However to anticipate any possible change in these trends it becomes desirable to examine each of the individual factors affecting population. In this article an attempt has been made to point out some of the changing demographic trends and their notable effects on the composition of Ontario's population.

This article, an extract from a more detailed study, was prepared by Mr. R. Kogler, Economist with the Economic Analysis Branch, Economic and Statistical Services Division, Department of Treasury and Economics.

Indicator Charts, Pages 18-20

Fluctuations in aggregate economic activity – commonly used to define business cycles – do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate – because they relate to future rather than present production – are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 18-20 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used – 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) – only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

According to most key indicators the Ontario economy is quite buoyant and growing at a faster rate than the national average. Average weekly wages and salaries in manufacturing rose 8.1 per cent to \$128.80 in the 12 months ending last July. In Canada, the average rose 7.9 per cent to \$122.25. Retail trade in the first eight months of 1969 is up 8.6 per cent in Ontario and up 6.4 per cent in Canada as a whole. Capital investment in Ontario in 1969 is expected to increase by 16.3 per cent over last year while an increase of 10.7 per cent is forecast for all of Canada. Unemployment in the province fell to 3.1 per cent in September, down from 3.4 per cent one year earlier. This compares very favourably with rates of 5.0 per cent for Canada as a whole in September 1969 and 4.8 per cent in September 1968.

The one notable exception to Ontario's pace-setting performance has been housing. Urban housing starts in Ontario are up only 9.0 per cent in the first nine months of the year, compared to a national increase of 17.2 per cent.

The most prominent feature of the Provincial and Canadian economy in the second half, however, continues to be increasing wages and prices. The Canadian Consumer Price Index rose once again during the month of October, to a level 4.4 per cent above that of October 1968. The housing, clothing, health and recreation components contributed significantly to this latest increase. This level of year-to-year price increase is down slightly from the more-than-five per cent annual increases recorded in June, July and August of this year but is still far above acceptable levels.

In an attempt to combat inflation and inflationary expectations the federal government introduced tight monetary policy measures early in the spring of this year. Since then, there has been virtually no increase in the money supply and very high interest rates combined with reduced government spending and a moderate degree of fiscal restraint. However, due to the inevitable lags between policy actions and ultimate results there is only limited evidence of a slowing rate of inflation at this time. Although economic policies appear to be working as intended and an adjustment has begun to take place in the Canadian economy, measurement is difficult because of the extensive labour strife.

Another significant factor influencing the success of anti-inflationary policies is the

effectiveness of similarly initiated and implemented policies in other countries, particularly the United States. Policies of economic restraint were introduced in the United States much earlier than in Canada and the effects of these policies are now becoming apparent. In September U.S. nationwide unemployment rose, a very slim gain was recorded for personal income and for the second month in a row the index of industrial production decreased. Moreover, preliminary figures on third quarter gross national product confirm weakness in housing activity, sluggishness in consumer spending and an essentially sideways trend in federal government expenditures. With policies of restraint becoming effective in the U.S., some moderation in the rise in U.S. prices is expected by early 1970. Thus, the inflationary impetus for the expansion of Canadian exports to the U.S. will begin to subside. Since the Bank of Canada will likely continue its restrictive monetary policy in the remaining months of 1969 the Canadian economy should continue to operate in an atmosphere of slow monetary growth and high interest rates as it approaches 1970. Moreover, Canadian business indicators suggest that the peak of the recent expansion was recorded in the fourth quarter of 1968, and that a markedly slower rate of growth of real gross national product occurred during the first half of 1969. If restrictive fiscal and monetary policies are maintained as expected, slower growth of production and employment and a reduction in the acceleration of labour incomes may be expected to take place throughout the remainder of 1969 and into 1970.

FEDERAL PROPOSALS FOR TAX REFORM

On Friday, November 4, Finance Minister E. J. Benson tabled the proposals of the long-awaited White Paper on Tax Reform. In this White Paper the federal government places before Parliament, the Canadian people and the provincial governments the most comprehensive tax reform proposals in more than twenty years.

For almost a decade the strengths and weaknesses of the federal income tax system have been closely studied and vigorously debated. Widespread recognition of inequities led to the 1962 appointment of the Royal Commission on Taxation which published its controversial report early in 1967. After lengthy study of this report and the comment upon it the federal government has

come to the following conclusions and recommendations based upon these findings:

Canadians in the lower income tax brackets face a heavy total tax burden. In recent years sales taxes and property taxes have been increased substantially. Where changes in the income tax can provide relief, it must be given to those with lower incomes. The government proposes increases in the exemptions to ease the burden on these individuals and families. Important forms of income and benefits escape taxation. The government proposes to bring them into taxable income. In particular, a tax on capital gains is proposed.

Tax can be avoided under the present law by clever devices. The reform must close loopholes now available to those with the wealth and expert advice to use them.

Wage earners are unable to deduct many legitimate expenses from taxable income. New deductions would be introduced to benefit employees and working mothers.

Corporations are taxed in ways that are open to abuse and that fail to recognize their differing relationships with shareholders. The government proposes changes under a new system that would be fairer to small shareholders and that would stimulate Canadian ownership of Canadian business.

The mineral industries enjoy special tax benefits that have existed for many years but that are unnecessarily costly and inefficient. Assistance to mineral exploration and development must do its intended job in a more direct way that is less costly in terms of revenue.

The Program in Brief

The following excerpts from the text of the White Paper summarize the federal government's proposals for tax reform:

The form of the personal income tax would be streamlined, greatly simplifying the individual's task in calculating his tax. The old age security tax and the social development tax would be merged into the graduated tax, and several other adjustments and surtaxes of recent years would be eliminated. The new graduated rates would determine the federal tax, and there would be no general abatement for provincial taxes. The provinces would be invited to apply their tax as a percentage of the federal tax, and on that basis the federal government would continue to collect this

revenue for the provinces without cost to them. The Old Age Security Fund would be credited with the equivalent yield of the present old age security tax.

Higher Exemptions

To remove or reduce taxes on lower-income taxpayers the government proposes to increase the basic personal exemption for a single person to \$1,400 from \$1,000 and for a married couple to \$2,800 from \$2,000. The basic standard deduction available in lieu of deductions for charitable donations and medical expenses would remain at \$100. Consequently those taxable as single persons with income under \$1,500 would have no tax to pay and those taxable as married would have no tax to pay if their incomes were under \$2,900.

This change in exemptions alone would take about 750,000 Canadians off the income tax rolls. Taken together with the other changes proposed, it would reduce taxes on almost 3,000,000 more at the low end of the taxable scale. The benefits which larger exemptions would otherwise give to those with higher incomes would be offset by higher rates of tax.

The new rates of tax would replace the present graduated rates, the provincial abatements, current surtaxes, the old age security tax and the social development tax. The rates would be revised to take into account the increase in exemptions, the taxation of capital gains, and the various other changes, while still bringing in the same amount of total federal revenue and serving as a base for the same total of provincial revenues. When the new employment expense allowance is taken into account (see below), the amounts of tax under the new rates would be less than the present tax on single persons up to an income of about \$3,400 per year, and on married persons up to an income of about \$9,100. For incomes above these levels the tax would be higher than under the current law, particularly when changes in the definition of income are taken into account.

Capital Gains as Income

The government has decided to include capital gains and a number of other benefits in income subject to tax. Reviews of this subject by the royal commission and the government led to the conclusion that this is essential in order to be fair between those receiving such gains and others deriving their incomes from other sources. Moreover, the taxation of

gains is essential to block loopholes effectively. The economic effects of taxing gains have been appraised and are considered unlikely to interfere significantly with incentives to save and invest in Canada.

Those who make substantial capital gains in the stock market or in real estate increase their ability to spend money just as those who earn wages or derive an income from carrying on business. Interest payments are already fully taxed. Capital gains are now widely sought as an objective in investment. Indeed the freedom of capital gains from tax is distorting the investment of savings under present circumstances.

In general, we propose to include capital gains fully in income for most classes of assets whenever they are realized by the sale of such assets, and to allow realized capital losses to be deducted from income. Certain exemptions would be permitted for taxpayers' homes and for articles of personal property. Special rules would apply to the marketable shares of widely-held Canadian companies. On such shares accrued gains would be taxed every five years and accrued losses allowed as deductions at such time. Only half the gain or loss on such shares would be taken into taxable income in recognition that the corporation income tax paid by such companies is only partially credited for personal income tax.

Once capital gains are included in taxable income, the portion of the total income of the wealthy that is brought to tax would be dramatically increased. The tax system would be significantly more progressive even without the ostentatiously high rates now in use. It is proposed that the marginal rates in excess of 50 per cent be reduced to the neighborhood of 50 per cent in four instalments as the capital gains subject to tax increase. Estimates based on 1969 incomes indicate that by the fifth year of the new system the inclusion of capital gains in taxable income should add about \$345 million to personal income taxes, while the reduction of the top rates to 50 per cent on other income should cost about \$40 million.

New Deductions

The government has examined the deductions individuals may claim for various costs they incur, as well as differences in treatment between taxpayers who are employed and those who carry on a business or profession. The royal commission said many employees have been over-taxed because they have been

denied the deduction of almost all expenses incurred in earning wages and salaries. But millions of taxpayers are involved, and a very wide range of expenses could be related to earning their employment income. These taxpayers do not keep detailed records. The government has found no practical way to permit employees to deduct actual costs as do those carrying on a profession or other business. We propose to provide employees with a general deduction to cover expenses, in addition to certain specified deductions. The amount would be 3 per cent of employment income, up to a total of \$150 a year. This could benefit more than 6,500,000 persons, the great majority of them earning less than \$10,000 a year.

Costs of looking after young children when both parents are working, or when there is only one parent and that parent is working, would be allowed as a deduction subject to certain conditions. This new plan is intended primarily to benefit mothers who need to work to support their families, and would be in addition to the normal exemption for children. The maximum expenses allowed would be the lower of \$500 per child under age 14 or \$2,000 per family.

Other Items in Income

By including more receipts in income the government proposes to make the definition of income more comprehensive and to distribute the tax load more fairly. Some additional revenue would arise from this change, but it would be offset by additional deductions to be allowed from income.

Various fringe benefits received by employees or by the owners of businesses would be included in income for the first time. For example, an employee or owner of a business with a business-owned car available for his personal use would be required to include a minimum amount in his taxable income unless he pays the business at least that amount for the use of the car. There are other fringe benefits whose value cannot readily be measured in the hands of the recipient; for example, the use of hunting and fishing lodges, yachts and airplanes, the payment of social and recreational club dues, and the entertainment costs that are included in expense accounts. These costs would no longer be deductible to the employer.

The government has decided that it would make the tax system fairer if the treatment of unemployment insurance were changed to permit workers to deduct their contributions

to the fund and to require them to pay tax on benefits received. Many of the benefits are received by employees with average or higher than average incomes who are unemployed for relatively short periods, and whose annual incomes equal or exceed the annual earnings of others. The higher their incomes the greater the tax benefit. It is fairer to tax them on this part of their income, as long as we permit all employees to deduct their contributions. Anyone on unemployment insurance benefits for most of the year is likely to pay little or no tax.

It is also proposed, in fairness to other taxpayers, that fellowships, research grants, scholarships and bursaries be treated as taxable income but subject to the deduction for tuition fees and costs incurred for research. Undergraduates would seldom need to pay tax because few scholarships and bursaries are larger than the new personal exemptions plus the fees that may be deducted from students' incomes. But if students have other income, there is no reason why they should not be taxed like other Canadians.

For many years, members of the armed services have been taxed under special regulations which are aimed at simplicity of administration but confer special benefits. The regulations are no longer necessary on administrative grounds and would be dropped. Members of the Canadian armed forces would then be taxed under the normal terms of the Income Tax Act.

A New System for Corporations

The government proposes to alter the method of taxing corporations by establishing a single rate of corporation tax and providing a system of credits to shareholders for corporate taxes paid. An important distinction would be made between private, closely-held corporations and public, widely-held corporations.

For closely-held corporations, which are usually smaller businesses managed by the shareholders, the tax should be related as closely as possible to rates paid by individual shareholders. There is usually a close identity between the shareholders and the corporation. These corporations usually compete in markets with unincorporated businesses subject only to personal income tax. Under the proposed plan the federal income tax paid by such corporations would be treated as a prepayment of the personal income tax on behalf of individual resident shareholders.

Under certain conditions the corporation could elect to be taxed as a partnership of its shareholders. In other cases the shareholders would pay tax on a sum that includes their dividends plus a related amount of corporate tax already paid; and they would then claim credit for the corporate tax paid, and qualify for a refund if their own rates are lower than the corporate rate.

The government believes that this is a fairer way of taxing the income of Canadians which flows through corporations than the existing system with its lower rate of corporate tax on \$35,000 of profits annually. It proposes to remove this lower rate gradually over a period of five years. Thereafter, the benefits of low rates of tax would go to shareholders with small incomes rather than to corporations with small incomes.

Widely-held corporations are usually larger businesses where the link between shareholders and management is tenuous. Such corporations are themselves important economic entities. Their products or services are usually sold in competition with other large corporations, where prices yield an adequate return after paying corporate tax. One half the corporate income tax paid by such corporations would be regarded as a prepayment of individual tax for individual Canadian resident shareholders, but the other half would not be linked in this way. Shareholders receiving dividends from profits taxed under the new plan would be liable for tax on the dividend plus an amount of "creditable tax" equal to half the dividend and would be given credit for that amount of tax. This system would be roughly equivalent to the present dividend tax credit for taxpayers in the 50-per-cent tax bracket and would be more favourable for those in lower tax brackets. It would thus provide a powerful incentive for investment by Canadians in Canadian corporations.

This new system would:

- offer a substantial inducement for Canadians to invest in Canadian business;
- when combined with the proposed method of taxing capital gains, make possible a fair and fully effective but economically tolerable tax system;
- prevent surplus stripping and most other tax avoidance devices;
- be fairer in its treatment of lower-income shareholders than the present

dividend tax credit and preferred low rate of tax on the first \$35,000 of corporate income.

The Mineral Industries

For many years special rules have been applied to determine the income from mining and from the production of oil and natural gas. These have been reviewed by the government in the light of the criticisms, proposals, briefs and discussions of the last several years.

The government has decided that some special rules should still apply in determining the income derived from the mineral industries, in order to encourage exploration for and development of mineral deposits. These inducements are intended to encourage the establishment and growth of highly productive industry in areas of Canada outside those where rapid urban and industrial growth are already occurring. However, the special rules should be revised substantially to ensure that really profitable projects pay a fair share of the national revenues, as other industries do, and that the inducements offered are efficient.

Two main changes are proposed. The first would replace the three-year tax exemption for new mines with a special rule permitting capital costs of fixed assets purchased for the development and operation of a new mine to be charged off against income from that mine as quickly as desired. This change would take effect in 1974 at the expiration of the period for which the government in 1967 gave assurances that the three-year exemption would continue. The new rule would ensure that in the high-risk business of mining, taxes would not be paid until investments in new projects are recovered, but it would do so on a more economical basis than the present exemption.

The second change concerns depletion allowances. The existing maximums would continue to apply — generally no more than one-third of production profits — but a taxpayer could run out of depletion allowances unless he continues to explore for, and/or develop, Canadian minerals. Every \$3 of qualifying expenditures made after this White Paper is published would "earn" the taxpayer the right to \$1 of depletion allowances if and when his production profits permit. Depletion allowances on new properties would have to be "earned depletion" immediately: "unearned" allowances would be continued for five years on existing properties as a transitional measure.

An Analysis of Population Growth Trends in Ontario

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POPULATION GROWTH

At the time of Confederation Ontario's population amounted to 1,525,000. A hundred years later it had grown to 7,149,000, an increase of 368.8 per cent or an average annual growth rate of 1.56 per cent. However, this growth was by no means uniform. Between 1867 and 1881 the rate of growth amounted to 1.68 per cent per annum; it declined to 0.62 per cent between 1881 and 1901; increased to 1.52 per cent between 1901 and 1931 and fell to 0.99 per cent from 1931 to 1941. Since 1941 the population of Ontario has grown at an annual rate of 2.46 per cent which is high by any standard. The high rate of growth between 1867 and 1881, 1901 and 1931 and since 1941 can be ascribed primarily to large immigration from abroad, whereas the low rate of growth during the period 1881-1901 can be attributed to outmigration from Ontario to the western provinces and the decrease during the 1931-1941 period was of course due to the depression.

Although the average annual growth rate for the period 1941-1968 was 2.46 per cent, the pattern was not uniform. It fluctuated between 0.8 per cent, the lowest point in 1943, and a very high rate of 4.3 per cent in 1957. However, since 1946 the rate has been generally over the 2.0 per cent mark, twice surpassing the 4.0 per cent level: in 1952 (the Korean war period) and in 1957 (during political unrest in central Europe, especially in Hungary).

Generally speaking, since 1941 the population of Ontario has grown at a faster rate than that of the rest of Canada, whose growth pattern varied between 0.7 per cent and 2.8 per cent per annum. This phenomenon can be explained by the fact that since the end of World War II, Ontario, apart from high birth rates, has consistently attracted more than half of the total immigration to Canada.

During the period 1901-1967 natural increase contributed 63.4 per cent and migration 36.6 per cent to the total population growth in Ontario. However, comparing the 1901-1941 and 1951-1968 periods it can be seen that in the earlier, pre-war period natural increase played a greater part in the overall population growth in Ontario, contributing 70.5 per cent whereas migration added only 29.5 per cent. During the post-war period, 1951-1968, the importance of natural increase as a source of population growth diminished, contributing only 58.7

per cent to the overall population increase, whereas the importance of migration has grown — its share of the increase during the period rising to 41.3 per cent.

Although during the period 1901-1968 natural increase was a principal source of population growth, during the years 1966, 1967 and 1968 the migration component displaced natural increase as the main source of population growth. The proportion of natural increase in these three years was only 43.6 per cent and that of the migration component 56.4 per cent. The natural increase component of population growth in Ontario has been steadily declining since 1960 (when it reached the apex), attaining in 1968 the 1951 level which was 33.3 per cent below that of 1960. If the current fertility trends continue migration will become the principal source of future population growth in Ontario, provided of course that the present high levels of immigration into Canada are maintained. If, however, immigration declines and birth rates do not improve, the rate of growth of Ontario's population will revert to the level of the 1930's.

Age Structure

No study of population growth can avoid some references to the age structure and changes therein since its economic and social implications are quite far-reaching. For example, age structure affects the composition of labour force, the size of the school population and birth, death and marriage rates.

Age structure is directly influenced by three demographic variables: fertility, mortality and migration. These variables are not entirely independent since any change in one of these influences the other two.

Table 1 in the appendix shows the age distribution of Ontario's population by ten-year age groups for census years beginning with 1901. In order to facilitate discussion of this table the population statistics presented may be divided into three main age groups, namely:

- infants and adolescents: 0-19,
- adults: 20-64
- the aged: 65 and over.

The main characteristics of these respective groups are:

- a) From the demographic point of view, the 0-19 age group plays only a relatively small part in the reproductive process, and in the economic sense is to a large degree non-productive.

- b) The 20-64 age group is the most active both in the demographic and economic sense. At the younger end of the scale, this group is characterized by high age-specific fertility rates, high marriage rates, low mortality rates and high migration rates. From the economic point of view it is the most productive age group which to a large degree supports the remaining two age groups.

- c) From the demographic point of view the 65 and over age group is characterized by high mortality rates and low migration rates. In the economic sense they are largely non-productive.

Scrutiny of Table 1 shows a marked decline in the proportion of the population under 20 years of age between 1901-1941 despite the fact that in absolute numbers this age group increased by 348,400 (or 38.1 per cent). This proportional decline was caused partly by falling fertility rates and partly by high migration rates. Since the propensity to migrate is strongest among young adults, high in-migration rates will of necessity augment the 20-64 age group.

The proportion of the youngest age group (0-19) has increased continuously between 1941-1966 — mainly as a result of the "baby boom" during the 1950's — reaching the 40.3 per cent level in 1966. However it did not surpass the high mark of 41.9 per cent of the population in 1901.

The middle age group (20-64) increased from 52.6 per cent in 1901 to 58.5 per cent of the population in 1941 and since then has declined steadily to 1966 when it reached the 51.5 per cent level.

The proportion of the senior age group increased from 5.5 per cent in 1901 to 8.7 per cent in 1951. It declined slightly in 1956 to 8.4 per cent and in 1961 to 8.1 per cent but started to rise in 1966 when it reached 8.2 per cent of the total population.

The increase in the ratio of the 65-and-over age group between 1901 and 1951 was caused mainly by the falling age-specific death rates as a result of vastly improved medical treatment. The slight decline in the proportion of this age group since 1951 is due to a sharp increase in the proportion of the youngest age group (0-19). Numerically the 64-and-over age group increased from 120,000 in 1901, to 400,400 in 1951 and to 567,700 in 1966.

It is fairly obvious that when the proportion of the active population becomes smaller

the burden of "dependency" increases. This is the result of two phenomena: (1) cohorts born in the early years of the century are successively reaching the age of 65 and are entering the dependent "aged" group, while (2) at the younger end of the scale the large number of cohorts born in the 1950's are still too young to enter the active adult life. The dependency ratio will start to fall in the seventies because of the fewer births in the sixties and because the large number of post-war-born will begin their active economic life. This trend will also be supported by the large-scale in-migration of the sixties which has augmented the proportion of the adult population.

Table 2 presents the "Ratio of Working-Age Population" by economic regions and counties. These figures, when subtracted from 100.0 per cent give the dependency ratio. This ratio was lowest in 1966 in the Central Ontario Region (37.4 per cent) followed by the Niagara Region (39.6 per cent). It was highest for the Georgian Bay Region at 43.2 per cent. The overall Ontario ratio was 39.8 per cent.

In 1931 the Ontario ratio was 34.8 per cent whereas the Central Ontario Region also had the lowest ratio of 30.8 per cent followed by the Niagara Region at 33.6 per cent. Northeastern Ontario had the highest dependency ratio in 1931 at 38.1 per cent.

Among the counties in 1966, York had the lowest dependency ratio of 36.6 per cent and the District of Manitoulin the highest with 47.2 per cent.

The index of aging of Ontario's population represents the 65-and-over age group as a percentage of the 0-14 age group. The index stood at 24.2 in 1931, rose to 32.6 in 1941, before declining to 25.2 in 1961. In 1966, it rose slightly and this trend is likely to continue in view of the declining birth rates.

The historical trend in this index for all Ontario has not always coincided with the historical trends for the various economic regions. For example, the upturn of this index in 1966 for the Province was not seen for the economic regions of Central and Mid-Western Ontario. In these regions the indexes continued to maintain a downward trend. On the other hand, in the Lake St. Clair Region, the upturn trend came earlier, in 1961, unlike most other regions where it first occurred in 1966.

Regarding the extent of variation in the indexes among economic regions, Northeast-

ern Ontario has had a very low index of aging as compared to any other economic region. This can be attributed to three factors. First, Northeastern Ontario has had a higher-than-average fertility rate in recent years. This has raised the percentage of population in the 0-14 age group. Secondly, Northeastern Ontario has had a higher-than-average death rate in the 65-and-over age group, lowering the percentage of population in this age group. Thirdly, this region has had a net in-migration of persons in the 0-14 age group while there has been a net out-migration in the 50-and-over age groups.

The median¹ ages of Ontario's and Canada's populations during the 1901-1966 period can be seen in the accompanying table. The median age of a population indicates generally how old or young the population is. For example, a median age below 30 reflects a relatively young and dynamic population. The median age of Ontario's and Canada's population during this period reached its highest point in 1951. Ontario has always had a higher median age than that of Canada as a whole, probably due to the province's lower birth rate and higher immigration rate.

When median ages of males and females are considered separately it is found that in Ontario the males had a higher median age until 1941. Since then the female median age has risen above that for males. This has been largely the result of comparatively higher rates of mortality decline for females than for males. However, for Canada, this reversal in the ratio between the median ages of males and females is observable only from 1956 onwards. Moreover, the gap between male and female median ages has been widening

since 1956. In view of the declining birth rates it is not certain how long this decline in median age for Ontario will continue.

Sex Composition

The sex composition of any population is the second most important biological factor affecting its demographic structure. The relative proportions of males and females in a given country at a certain period of time are the result of past fertility, mortality and migration. The simplest measure of this variable is the sex ratio, defined as the number of males per 1,000 females (sometimes calculated on the basis of 100 females).

In most populations there is always some imbalance of sexes because of:

- A preponderance of males or females, usually the former, at birth. The sex ratio at birth in Canada and Ontario averaged 1,057 males to 1,000 females during the period 1921-1966 (within the range of 1,041-1,075 for Ontario, and 1,046-1,081 for Canada during the same period).
- A sex-selective death rate. Women in Canada live on the average longer than men. In 1966 the average age at death in Ontario was 63.1 among men and 67.7 among women; in Canada 62.0 among men and 65.9 among women.
- A sex-selective migration.

These factors shape the sex composition of Ontario's population. When the birth rate is high, the sex ratio adjusts in favour of males. This is reversed later as a result of the lower mortality rates for females. This has been so in spite of the preponderance of male immigrants over female immigrants throughout the 20th century with the exception of the

Median Age of Population by Sex, for Ontario and Canada, 1901-1966

Year	Ontario			Canada less Ontario			Canada		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1901	24.1	24.1	24.1	22.3	21.2	21.9	22.9	22.4	22.7
1911	25.9	25.6	25.8	23.9	21.4	22.8	24.5	22.9	23.8
1921	27.0	26.6	26.8	23.6	21.5	22.5	24.8	23.2	23.9
1931	27.8	27.7	27.8	24.4	22.5	23.5	25.5	24.0	24.7
1941	29.9	29.8	29.9	26.4	25.1	25.7	27.5	26.6	27.0
1951	29.9	30.3	30.1	26.7	26.3	26.5	27.8	27.6	27.7
1956	29.2	29.8	29.5	26.0	25.9	26.0	27.2	27.3	27.2
1961	27.9	28.8	28.4	25.0	25.3	25.2	26.1	26.6	26.3
1966	26.5	27.9	27.2	24.3	24.9	24.6	25.0	26.0	25.5

¹the age which divides a population into two equal parts, half above the median age and half below it. (The other measure of central tendency, the mean (average) could also

be calculated by summing all the ages of persons and dividing by the number of persons in the distribution. The mean is more difficult to calculate, and is influenced by extreme values.)

period 1961-1966 when females formed 51 per cent of total immigration.

Since 1957 there has been a continuous decline in the sex ratio. This is the result of lower birth rates and higher rates of mortality decline for women. Analysis of historical data on mortality rates during the period 1921-1966 reveals that when mortality rates declined, female mortality rates, especially in the higher age brackets, declined more sharply than male mortality rates. During 1921-1966 the mortality rates for males in the 45-49 age group fell by only 21 per cent as compared to a 55 per cent decline for females. In the 55-59 age group, the death rate for males changed very little, while the death rate for females declined by 44 per cent. In the next higher age group, the female death rate decreased by 41 per cent, but the male death rate remained stable. In the 70-and-over age group also females registered a higher rate of mortality decline than males. This significant differential in the decline of mortality rates between males and females explains the decreasing sex ratio for males in spite of a favourable position at birth.

SPATIAL DISTRIBUTION AND URBANIZATION

Spatial distribution is a continuous process involving shifts in the population. In Ontario, as in other areas population movement is influenced to a considerable degree by the type and scale of economic activities being carried out in specific regions of the province. Agricultural populations are generally considered to be more evenly distributed geographically than populations with more diverse economic activities. On the other hand, manufacturing and service industries, with their demands for large pools of readily available labour, stimulate dense population concentrations. However, recent trends towards greater farm mechanization (which in turn necessitate formation of commercially viable farm units) will release more people from agriculture in future. Some estimates predict that the farm labour force may be cut by as much as 50 per cent in the not-too-distant future. The surplus rural population will then be drawn to the ever-growing urban centres. This should not represent an extremely large influx since in 1966 only 6.9 per cent of the total Ontario population were engaged in farming.

Technological advances in mining and forestry have also reduced the demand for

labour. Thus, the expansion of mining and forest operations will exert less influence upon population distribution in the future than it did in the past.

The distribution of population throughout Ontario is highly uneven. In the District of Kenora one person has approximately three square miles of living space at his disposal, whereas in the County of York, according to the latest census, 2,288 people live on one square mile. The northern part of Ontario, north of Lake Nipissing, which comprises roughly 300,000 square miles, or 90 per cent of the total area of Ontario, has only 10 per cent of Ontario's population. South of Lake Nipissing, 90 per cent of population lives on the remaining 10 per cent of the land area. In numerical terms the vast area north of Lake Nipissing accommodates as many people as the Township of East York!

South of Lake Nipissing, 6,221,200 Ontarians are living on 45,700 square miles, which gives us a density of 136 persons per square mile. However, even this density is relatively low by international standards. The area of Southern Ontario is slightly less than that of England (50,371 square miles) — but England has 47,000,000 people or a population density of 933 per square mile.

In addition, spatial distribution in the southern portion of Ontario is highly uneven. One third of Ontario's population is concentrated in the vicinity of Metropolitan Toronto. Examining the situation more closely it can be seen that Ontarians tend to cluster in and around large cities. The seven Census Metropolitan Areas: Hamilton, Kitchener, London, Ottawa, Sudbury, Toronto and Windsor — had in 1966 a combined population of 3,720,452 or 53.5 per cent of the total population of the province. Fifteen years earlier, the same seven urban areas had only 2,192,263 people or 47.7 per cent of the total. This gives us an average metropolitan growth rate of 3.6 per cent in comparison with the total provincial population growth rate of 2.8 per cent per annum, or an absolute increase for the province of 2,363,328 people in the period 1951-1966. The net gain in population of the seven Census Metropolitan Areas between 1951-1966 was 1,528,200 or 64.7 per cent of the total population growth of Ontario during that period. During the same period, the population living outside the seven urban centres grew in absolute terms by 835,100. This represents an increase of only 35.3

per cent and an average annual growth rate of only 2.0 per cent. In other words, the growth rate of the population living in the seven metropolitan areas was almost twice that of the rest of the provincial population.

In 1901 there was only one city (Toronto) with a population more than 100,000 and it contained 9.3 per cent of the total provincial population. In 1966 there were nine such centres containing 56.5 per cent of the province's population.

The ratio of urban population living in centres of 5,000 and over in 1966 was 75.5 per cent, whereas in 1901 it was only 26.6 per cent and in 1931, 49.5 per cent.

From this evidence one may conclude that the process of urbanization in Ontario has indeed been quite rapid. In 1966 the proportion of population living in Census Metropolitan Areas and in Major Urban Areas (as defined by Dominion Bureau of Statistics) was 66.3 per cent. The United States census of 1960 shows that 62.0 per cent of Americans were living in Standard Metropolitan Areas. Allowing for the time lapse it is safe to assume that the degree of urbanization in Ontario has been about the same as that of the U.S.A.

The concentration of population in the seven major urban areas of Ontario is expected to continue as people move away from rural areas. In addition to the seven major agglomerations already mentioned, some smaller centres of population are forming — to name a few, the Lakehead, Niagara, Kingston and Peterborough. The main drawing point of the agglomerations is that they provide a focus for human activity. They are the centres where goods and ideas are exchanged, and where political, cultural and social life are concentrated.

Turning briefly to an examination of the growth pattern among counties and districts in Ontario during the period 1961-1966, we find that population growth in eight counties surpassed the overall Ontario growth rate and the population of nine counties actually declined. Fifteen counties had a growth rate of 1.1 per cent to 2.2 per cent per annum, and twenty-two had a growth rate of only 0.01 per cent to 1.0 per cent per annum.

It can be readily observed that all the rapid-growth counties have within them, or are situated near, a conurbation, whereas counties whose population has declined lack such centres. Of the nine counties with declining populations Elgin and Renfrew may

Counties with above-average growth, 1961-1966	Annual Rate of Growth	Counties whose population declined, 1961-1966	Annual Rate of Decline	regions of Ontario, was as follows in 1901 and 1966:		
				Economic Regions	1901	1966
Peel	9.1	Haliburton	2.8	Eastern Ontario	6	15
Halton	5.7	Manitoulin	1.2	Lake Ontario	3	8
Ontario	4.7	Glengarry	1.1	Central Ontario	1	21
Waterloo	4.2	Parry Sound	0.9	Niagara	3	14
York	3.1	Rainy River	0.6	Lake Erie	3	7
Carleton	2.9	Elgin	0.3	Lake St. Clair	3	5
Lincoln	2.9	Dundas	0.1	Mid-Western Ontario	4	8
Middlesex	2.4	Prescott	0.1	Georgian Bay	3	8
		Renfrew	0.04	Northeastern Ontario	1	9
				Northwestern Ontario	2	4
				Total	29	99

move in the future into the growth category since they have some potential with regard to industrialization.

A comparison of the regional rates of population growth shows that the Central, Niagara, Northwestern and Northeastern Regions had mostly higher than the average annual growth rate for Ontario during 1911-1966. The rest of the regions had mostly lower than the average annual growth rate for Ontario. However, among the former group of regions all except Central Ontario show lower than the average growth rate for Ontario in recent years as seen below.

The share of the various economic regions in the population of the province has undergone significant changes in the period 1901-1966. Eastern Ontario's share in the total

population of the province decreased from 18.6 per cent in 1901 to 12.2 per cent in 1966, Lake Ontario's share decreased from 10.9 per cent to 5.0 per cent; Lake Erie's from 9.8 per cent to 6.3 per cent; Mid-Western Ontario's from 10.1 per cent to 6.1 per cent and Georgian Bay's from 12.7 per cent to 4.7 per cent.

The economic regions: Central Ontario, Eastern Ontario and Niagara together contained over 60 per cent of Ontario's population in 1966. York County alone had 29 per cent of the province's population and this county along with Carleton, Wentworth, Middlesex and Essex contained nearly 50 per cent of the total provincial population.

The distribution of cities, towns and villages of 5,000 and over, among the ten

Because of the small urban population in the Northwestern and Northeastern Ontario Regions in 1901 the size of the cities, towns and villages in these areas has increased 40 to 60 times over the 65-year period. The increase over the 65-year period has been about 10 to 12 times for the Niagara, Central Ontario and Lake St. Clair Regions. For the Eastern Ontario, Lake Ontario, Lake Erie and Georgian Bay Regions the increase was in the range of five to seven times the 1901 population.

FERTILITY

The study of the frequency of the two absolute events in the life of every person — birth and death — has interested inquisitive men for quite some time. A number of people during the 17th and 18th centuries observed some regularity in their occurrence, which suggested to them that a type of natural law could be observed or a form of measurement could be formulated in order to make comparisons possible over time in the same population, as well as to compare these events among different populations at the same period of time. Johann Peter Susmilch (in his work "The Heavenly Order", Berlin, 1741) was one of the first to suggest that such measurements are possible in the form of a ratio of births and deaths for a given number of persons. Since then, this crude measurement, which is still used today for quick comparisons, has undergone several refinements, as for example the introduction of the concept of 'age-specific' birth rate, which denotes the number of births a year per thousand

Economic Regions Showing Population Growth Rates Higher (x) or Lower (—) than for Ontario, 1911-1966

Regions	1911	1921	1931	1941	1951	1956	1961	1966
Eastern Ontario	—	—	—	x	—	—	x	—
Lake Ontario	—	—	—	—	—	—	—	—
Central Ontario	x	x	x	x	x	x	x	x
Niagara	x	x	x	x	x	x	—	—
Lake Erie	—	—	—	—	x	—	—	—
Lake St. Clair	—	x	x	—	x	—	—	—
Mid-Western Ontario	—	x	—	—	—	—	—	—
Georgian Bay	—	x	—	—	—	—	—	—
Northeastern Ontario	x	x	x	x	—	—	—	—
Northwestern Ontario	x	x	x	x	—	—	—	—

women of a given age, or the 'gross reproductive rate' which tells us how many female children will be born per thousand mothers in their lifetime if the observed birth rates remain constant through their reproductive period.

A study of fertility trends in Ontario during the period 1921-1968 reveals that sizable variations have occurred in both the crude birth rate and in its various refinements. Similar trends here occurred elsewhere in the western world. In Ontario both the direction and the degree of these fluctuations were concomitant to the general behaviour of this variable abroad, at least in countries of a similar socio-economic structure.

Crude birth rates declined steadily during the second and third decades of this century from a relatively high level of 25.3 births per thousand population in 1921 to the lowest point ever recorded in Ontario of 16.9 births per thousand population in 1937.

A similar decline occurred in most other countries as the following table illustrates:

Country	Births per 1,000 Population	
	1921-30	1930-40
United States	23.5	17.2
England and Wales	18.3	14.8
France	18.8	15.5
Switzerland	18.5	15.8
Sweden	17.5	14.4

From 1937 onward the fertility curve started to climb, reaching its highest point of 26.8 births per thousand population in 1957. After reaching this point a downward trend began and in 1968 only 17.4 births per thousand population were recorded, which is only slightly higher than the record low level of 1937.

In the light of the foregoing observations it is difficult to reach a conclusion as to whether the upturn in the fertility curve between 1937 and 1957 was only a temporary phenomenon representing births postponed because of war conditions or part of a cyclical pattern. The period under observation is too short to arrive at a meaningful conclusion.

A more refined measurement of fertility is the ratio of the number of children born per thousand women of childbearing age: 15-49 or 15-44 (the age bracket differs from country to country). This rate is usually referred to as the 'general fertility rate' (not to be con-

fused with the 'total fertility rate'). The obvious advantage of this rate is that it eliminates the influence of differences in the sex and age structures of different populations, such as the preponderance of males over females, as well as the proportion of women who are not in the child-bearing age bracket. However, it does not eliminate differences in the age distribution of women in the reproductive age bracket (15-49) and it does not take into account the marital status of women in this particular age bracket.

The general fertility rates are usually four to five times higher than the crude rates since the proportion of women in the reproductive age bracket constitutes from $\frac{1}{3}$ to $\frac{1}{4}$ of the total population. The general fertility rates in Ontario, like the crude birth rates, have undergone the same variations over the period of time (1921-1968) except for the decade 1950-1959 when the general fertility rate increased twice as fast as the crude birth rate. This would indicate that a change in the age pattern of fertility occurred, most probably as a result of births postponed during the war.

During the period 1951-1966 the average general fertility rate for the Province was 98.70.

Tables 3 and 4 provide age-specific birth rates for Ontario and Canada. Age-specific birth rates constitute the most important refinement in the measurement of fertility and they are arrived at by dividing the number of births to mothers of each age group in a given year by the number of women of this age and multiplying this figure by 1,000. In other words, it is the number of births a year per 1,000 women of a given age.

Scrutiny of the age-specific birth data for Ontario during the period 1921-1966 shows the importance of the 20-24 and 25-29 age groups. These two age groups account for the majority of total births. Between 1921 and 1941 the 25-29 age group was the most fertile. In 1941 the 20-24 age group moved into first place, replacing the 25-29 age group as the most fertile. The 30-34 age group has maintained third place during the whole period. The shift in the relative positions of the 20-24 and 25-29 age groups was mainly due to the fact that after 1941 the average age at which marriages were contracted was lowering, and also that the reproductive process was beginning earlier in marriage. Another factor might also be the shift to smaller families, or the earlier completion of the reproductive cycle.

Comparisons of fertility rates for the seven female age groups shows that all of them, except the 15-19 age group, experienced a decline in fertility between 1921 and 1941. From 1941 onward, fertility for all age groups was increasing, reaching a post-war peak in 1957 for the 15-19, 35-39, 40-44 and 45-49 age groups, whereas the age groups 20-24, 25-29, 30-34 reached their peak three years later in 1960. The combined weight of fertility of these three age groups carried the fertility curve in Ontario to its apex in 1960.

The following table illustrates the fertility behaviour of the seven age groups during the period 1921-1966:

Age Group	Per Cent Increase or Decrease	
	1921-1960	1960-1966
15-19	+100.0	-19.0
20-24	+ 60.5	-29.0
25-29	+ 25.2	-26.2
30-34	- 5.8	-26.7
35-39	- 27.0	-26.4
40-44	- 44.3	-25.0
45-49	- 70.6	-13.3

Between 1921 and 1960 the three youngest age groups experienced a substantial increase in fertility rates, whereas in 1960 the remaining four age groups had a lower fertility rate than at the beginning of the period. The youngest age group (15-19) doubled its fertility rates, the oldest (45-49) showed a significant decline - to such a degree that it is presently considered, for practical purposes, advisable to delete this age group when calculating the general fertility rate.

Between 1960 and 1966 the youngest (15-19) and the oldest (45-49) age groups have recorded the smallest reductions in fertility rates, the latter because it already had a very insignificant rate. The fertility rates of the remaining five age groups declined almost at a uniform rate, ranging from 25.0 per cent to 29.0 per cent.

Let us now turn our attention to Table 5 which shows the 'Birth by Order in Family' pattern in Ontario during the period 1927-1966. This table provides important statistical information on past and future trends in fertility. At the same time it can provide a clue to the future trends in population growth patterns.

Scrutiny of this table allows us to formulate a general statement concerning the relationship between fertility levels and the

birth order in families, namely that during a period of high fertility the proportion of first and second births in families decreases, whereas in periods of low fertility the reverse is true. The explanation of this relationship is simple. A reduction in fertility is usually achieved at the expense of higher order births in families, that is, by foregoing a third, fourth . . . etc. child in the family.

During the period of declining fertility (1927-1941) the proportion of first births increased by 48.8 per cent, and remained high during 1941-1947. From 1947 to 1963 — a period of high fertility in Ontario — the proportion of first births fell by 28.8 per cent, and between 1963 and 1966 — a period of declining fertility — they increased by 26.3 per cent.

Conversely, the proportion of higher order births in families (six or more) fell during the period 1927-1941 by 40.3 per cent, remained low during 1941-1947, increased by 37.5 per cent between 1947 and 1963, and fell by 25.3 per cent between 1963 and 1966.

The analysis of the births order in the family could also be conducted with reference to the problem of population reproduction. In other words, the question could be asked whether the prevailing fertility trends will allow the present generation to be replaced by a generation of equal size, creating a stationary population, or replaced by a generation larger than the present one (expansive trend), or by a smaller generation (constrictive trend).

It is obvious that one child in a family does not allow for a straight reproduction of one generation by another one of equal size. Neither does a two-children family, since we must take into account mortality and such factors as those who never marry, as well as childless couples. At best only three-children families can predicate a straight replacement of one generation by another one. Some demographers maintain that this is possible only with four-children families. This of course is a matter of opinion, as well as a given community's age and sex structure, prevailing marriage rates, etc.

However, the undisputed fact remains that births of the fifth order or more will establish an expansionary trend of population growth, assuming no migration.

Scrutiny of Table 5 reveals that in Ontario only prior to 1931 was the proportion of first and second order births below the 50 per cent mark. From 1931 onwards the ratio steadily increased reaching its highest level

of 66.4 per cent in 1947, then, with improving fertility rates the ratio started to decline, reaching a post-war low of 51.9 per cent in 1963 and thereafter resuming an upward trend, reaching a level of 60.1 per cent in 1966 — equal to that in 1940.

The question may then be asked, how does one explain the rapid growth rate of population in Ontario, discussed earlier, in the light of the foregoing argument that a two-children family trend will produce a constrictive trend on population growth? Simply stated, the growth of population in Ontario in recent years was sustained by a large scale immigration, as well as by declining mortality rates.

MIGRATION

Population growth of any given area depends upon the interplay of two sets of variables:

- the natural increase, which is dependent on the interaction of fertility and mortality trends and;
- net migration, which is the sum of the following components;
 - a) net international migration (immigration — emigration),
 - b) net interprovincial migration (in-migration — out-migration),
 - c) intra-provincial migration.

Net International Migration

Since the end of the war Ontario has received the largest share of immigrants arriving in Canada. At the turn of the century Ontario received only 12.6 per cent of the total number of immigrants to Canada, while in 1967 the province's share increased to 52.4 per cent. This was not the largest share ever received, since in 1947, 1956 and 1966 the ratio of immigrants who declared that Ontario would be their destination topped the 55.0 per cent mark. During the period 1946-1967 Ontario received 52.6 per cent of the total immigration to Canada (1,537,000 out of 2,922,000). In absolute figures the number of immigrant arrivals increased from 6,200 in 1901 to 116,850 in 1967.

The volume of immigration in any particular period of time depends upon the interplay of economic and political conditions in Canada and abroad. Usually immigration increases when economic conditions are favourable in Canada and relatively depressed in Europe. Political events abroad also influence the flow of immigrants, as for example the post-war upheaval in Europe,

the political unrest in Central Europe in 1956 and 1957 and the most recent events in Czechoslovakia. However, future Canadian immigration will be directed mainly by our internal economic situation. This policy is plainly spelled out in the recent Immigration Act which states that the principle of selecting immigrants is to be based on the requirements of the Canadian labour force (skill and need principle). Similar legislation recently passed by the United States Congress is now affecting emigration from Canada to the United States.

For these reasons it is difficult to foresee future levels of immigration, but the general impression prevails that in the long run the average number of immigrants settling in Ontario will be between 75,000 and 100,000 per annum.

In order to arrive at the net international migration figure for any time period it is necessary to subtract the number of Ontario residents who have moved abroad. There is no official record of such movements. Some of the required information can be extracted from United States and United Kingdom sources.

Emigration to the United States fluctuated during the post-war period between 20,000 persons in 1946 and 51,000 in 1964. Since then emigration to the United States has been falling off, partly because emigrants are exposed to the draft legislation, as well as the recent immigration legislation making it more difficult for prospective emigrants to qualify for entry. However, the non-economic factors may change and the restrictions imposed on immigration may be relaxed with respect to immigrants from Canada.

Emigration to the United Kingdom is of a smaller order — roughly one-quarter of the total emigration to the United States. During the period 1946-1966 the figures were:

U.S.A.	704,420
U.K.	165,689

The emigration curves to both of these countries ran in opposite directions during the period 1946-1953; emigration to the U.S.A. rose steeply from 20,000 in 1946 to 36,300 in 1953, while emigration to the U.K. fell from 9,100 in 1946 to 6,900 in 1953, reaching a low point of 5,000 in 1951. From 1953 to 1961 both curves moved in the same direction, i.e. upward, reaching a high level of 47,500 emigrants to the U.S.A. in 1961 and 12,200 emigrants to the U.K. in 1959. Between 1961 and 1965 emigration to the

U.S.A. stabilized around 50,000 persons per annum, falling sharply to 37,300 in 1966. On the other hand, emigration to the United Kingdom has declined sharply since 1959, reaching its lowest post-war level of 3,300 persons per annum in 1966.

Emigration to the rest of the world is very difficult to estimate, but on the whole it is not considered to constitute a significant quantity.

Beginning with 1959 statistics are available showing immigration to Ontario by the country of last permanent residence. Five countries, Great Britain, Italy, Germany, the United States and France contributed 399,300 or 66.6 per cent of all immigrants during the period 1959-1967. The percentage breakdown for each country is shown in the following table:

Great Britain	29.2%
Italy	21.1%
United States	8.4%
Germany	6.8%
France	1.1%
Total	66.6%

The remaining 199,795 immigrants, 33.4 per cent of the total, came from the following areas:

Other West European Countries	18.1%
East European Countries	3.7%
Australia and New Zealand	1.5%
Africa	0.9%
Asia	3.4%
Middle East	1.7%
West Indies	2.2%
Central America	0.2%
South America	1.7%

It is interesting to note that during this period immigration to Ontario from the West Indies, Asia and Africa increased in absolute numbers almost eight times, from 1,819 persons in 1957 to 13,756 in 1967.

During the period 1946-67 Ontario absorbed 1,536,700 immigrants of which 800,050 (or 52.1 per cent) intended to join the labour force and 736,650 (or 47.9 per cent) were classified as dependants. Some of the latter group also entered the labour force

upon completion of their education, or, in the case of wives, when they found it convenient to do so.

The occupational mix of immigrants intending to join the labour force upon entry into Ontario, underwent a significant change during the twenty-one year period. The proportion of immigrants with "Professional and Technical" qualifications increased from 3.9 per cent at the beginning of the period to 19.8 per cent at the end of the period. Similarly, the ratio of immigrants in the clerical and service fields increased from 12.8 per cent to 24.1 per cent. Immigrants with skills useful in manufacturing and construction fluctuated around the 23.0 per cent and the 10.0 per cent level respectively. The proportion of unskilled labourers rose between 1946 and 1960 from 11.8 per cent to 14.3 per cent but declined to 11.0 per cent in 1967.

On the other hand, the proportion of immigrants in primary occupations (agriculture, fishing, logging and mining) fell from 24.0 per cent in 1946 to 3.9 per cent in 1967. Similarly, the proportion of immigrants with skills suitable to the transportation industry fell from 2.4 per cent to 1.1 per cent.

Occupations of Immigrants to Ontario by Main Occupational Divisions 1946-1967

	1946-1952		1953-1955		1956-1960		1961-1967		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
All Occupations	222,522	100.0	121,281	100.0	212,092	100.0	244,157	100.0	800,052	100.0
Professional and Technical	8,636	3.9	12,195	10.1	22,073	10.4	48,597	19.8	91,501	11.4
Managerial and Official	n.a.	—	2,077	1.7	2,290	1.1	5,372	2.2	9,739	1.2
Clerical	15,439	6.9	11,211	9.2	24,955	11.7	33,260	13.6	84,865	10.6
Finance	n.a.	—	231	0.2	632	0.3	602	0.2	1,465	0.2
Sales	9,295	4.2	4,407	3.6	9,066	4.3	7,422	3.0	30,190	3.8
Service	13,045	5.9	16,347	13.5	29,692	14.0	25,745	10.5	84,829	10.6
Agriculture, Fishing, Logging	49,684	22.3	16,195	13.4	17,545	8.3	9,346	3.7	92,770	11.6
Mining	3,775	1.7	502	0.4	2,279	1.1	604	0.2	7,160	0.9
Manufacturing and Mechanical	53,774	24.1	25,497	21.0	45,518	21.5	58,512	24.0	183,301	22.9
Construction	20,286	9.1	12,154	10.0	21,412	10.1	23,389	9.6	77,241	9.7
Transportation	5,257	2.4	2,174	1.8	3,697	1.7	2,647	1.1	13,775	1.7
Communications	n.a.	—	614	0.5	1,565	0.7	1,092	0.4	3,271	0.4
Unskilled Labourers	26,279	11.8	16,487	13.6	30,313	14.3	25,828	11.0	98,907	12.4
Occupation not stated	17,052	7.7	1,190	1.0	1,055	0.5	1,741	0.7	21,038	2.6
Total Dependants	182,799	—	109,431	—	199,987	—	244,428	—	736,645	—
Total Immigrants	405,321	—	230,712	—	412,079	—	488,585	—	1,536,697	—

Net Balance of Interprovincial Exchange of Migrants¹

Province	1931-41	1941-51	1951-61
Newfoundland	—	—	8,100
Prince Edward Island	750	3,860	6,480
Nova Scotia	1,400	22,600	28,540
New Brunswick	2,400	18,500	20,550
Quebec	8,400	27,650	17,700
Manitoba	24,300	28,100	17,500
Saskatchewan	27,400	36,200	23,000
Alberta	6,100	7,250	2,930
British Columbia	-2,500	-8,100	-500
Yukon and N.W.T.	100	-900	100
Net Gain for Ontario	68,350	135,160	124,400

¹Estimated.

Interprovincial Migration

The extent of interprovincial migration in Canada can be gleaned from decennial census reports. For the purpose of this study three decades have been selected for comparison, namely: 1931-41, 1941-51, and 1951-61. Throughout the discussion of the effects of interprovincial migration on the population of Ontario we will refer to these as the first, second and third periods.

The estimated net gains accrued to Ontario because of these interprovincial movements of people were:

1931-41	68,350
1941-51	135,160
1951-61	124,400

The estimated net balance of population movements with each province was as indicated in the above table.

It should be remembered that the foregoing table shows *net balances* which, with the exception of British Columbia, were in favour of Ontario in all three decades examined. The exchange of people across provincial boundaries has never been a completely one-sided movement. On the contrary, these interprovincial movements exhibit a multi-directional pattern, involving all provinces. However, these movements are almost impossible to trace unless Canada adopts a central population registry — a most unlikely supposition, since the creation of such an office would meet with almost universal opposition. The magnitude of these interprovincial population exchanges does however lend itself to statistical analysis, which has produced the following estimate for the period 1951-61 in the form of a *ratio*

of the number of out-migrants (from Ontario) to a particular province, to the number of in-migrants (to Ontario) from a particular province:

Ratio of Out-migrants to In-migrants, Ontario, 1951-1961¹

Province	Ratio
Newfoundland	15.7
Prince Edward Island	8.6
Nova Scotia	26.1
New Brunswick	23.4
Quebec	68.3
Manitoba	22.8
Saskatchewan	0.0
Alberta	76.9
British Columbia	103.8
Yukon and N.W.T.	90.6
All Provinces	39.0

¹Ratios based on interprovincial migration estimates.

This table shows that the number of Ontario residents moving to British Columbia exceeded the number of British Columbia residents moving to Ontario by almost 4.0 per cent. Very high exchange rates are estimated for Alberta and Quebec. The Yukon and N.W.T. also show a very high ratio of exchange but in absolute numbers these exchanges involve less than 1,000 persons in each direction. Very low exchange rates are estimated for Newfoundland and Prince Edward Island. Population exchange with Saskatchewan appears to be a one-way operation, in favour of Ontario. Exchange

with Nova Scotia, New Brunswick and Manitoba appears to be approximately a one-to-four ratio; for every Ontario resident moving to these provinces we receive four in return.

It may be useful at this stage to place the two main sources of population growth in Ontario — natural increase and net migration — into some perspective. The relationship of the population growth components in Ontario during the period 1931-1961 can best be illustrated by the table on page 12.

All this yields several interesting observations:

- the total size of population increments between these three periods increased 127.5 per cent between the first and second periods, and 102.3 per cent between the second and third periods.
- the relative importance of the two components of population growth — natural increase and net migration — are changing. Natural increase diminished from 78.2 per cent in the first period to 58.1 per cent in the third period. On the other hand, the net migration component increased its share from 21.8 per cent in the first period to 41.9 per cent in the third.
- an even more dramatic change occurred in the relative positions of the two sub-components; in the first period (1931-41) international migration played a minor part in the growth of Ontario's population (2.6 per cent), whereas in the last period (1951-61) it accounted for 34.3 per cent of the total growth of the province's population. The net interprovincial migration contributed almost $\frac{1}{5}$ to the total population increment in the first period (19.2 per cent) whereas in the third period its contribution fell to 7.6 per cent. In other words, during the first period, for every immigrant from abroad Ontario received roughly seven people as a result of interprovincial migrations (mostly from the Prairie provinces — 85.0 per cent); during the second period the ratio of immigrants to interprovincial migrants was almost 1:1; and during the third period for every person who moved to Ontario from another province we received 4.5 people from abroad.

Internal Migration in Ontario

Although internal migration does not contribute to the overall growth of population of any province and country it does serve as an

Components of Population Growth, Ontario 1931-1961

	1931-41		1941-51		1951-61	
	Number	% of Total Population Growth	Number	% of Total Population Growth	Number	% of Total Population Growth
Total Population Growth in Ontario	355,972	100.0	809,887	100.0	1,638,550	100.0
Natural Increase	278,488	78.2	520,494	64.3	951,930	58.1
Net Migration	77,484	21.8	289,393	35.7	686,620	41.9
(Net International Migration)	9,178	2.6	154,238	19.0	562,228	34.3
(Net Interprovincial Migration) ¹	68,306	19.2	135,155	16.7	124,392	7.6

¹Estimated.

important vehicle of population redistribution. The causes stimulating internal migration are varied and usually involve both "push" and "pull" factors, which fall into three basic categories: personal, sociological and economic.

Personal: family reasons, retirement, illness, etc.

Sociological: maladjustment to community, wanderlust, presence of relatives or friends, physical and cultural amenities, etc.

Economic: better employment opportunities, better wages, better working and living conditions, population pressure, technological changes in industry and agriculture, transportation facilities, etc.

Economic considerations always play an important part in migration. People tend to move from areas of low economic opportunity to areas of high economic opportunity. On the other hand, the non-economic factors such as better physical and cultural amenities cannot be overlooked. It is difficult to separate these factors, since in most cases they augment each other. However, it is safe to assume that some combination of economic and socio-cultural factors are the motivating forces in internal migration.

Direct measurement of internal migration is impossible in the absence of a central population registry. However, some measurement can be achieved by asking certain questions during the national census, as was done in 1961 and will probably be repeated in the 1971 census. Such questions may allow us to calculate the volume and the direction (in a

very broad sense) of migration streams. On the whole, however, these measurements lack precision and at best present only a general indication of the volume and direction of internal migration.

There are few surprises in the listing of counties which have gained population, since all of them include, or are located near, major urban centres. However, there are some surprises on the "loss" side of the balance sheet which should be explained. York County is shown as losing 2,500 people, which is interesting considering the number of immigrants it has attracted. However, it can be safely assumed that these people probably moved to the neighbouring Counties of Peel and Halton, both of which have shown large gains. The same could be said about Wentworth County which is also shown on the losing side of the balance sheet and whose residents probably moved across to Halton County (Burlington). Essex County is shown as the biggest loser but this is easily explained by the fact that during the period of 1951-61 economic conditions in that area were rather depressed. The same explanation applies for Welland County.

Tentative estimates of intra-provincial migration during the period 1961-66 suggest that the propensity to migrate increased. However, these estimates are less accurate than those for the period 1951-61 because we have no reliable data on the distribution of immigrants across the province.

These estimates show that only nine counties definitely gained through these movements, eleven were only slightly affected and thirty-four lost a large number of their resi-

dents. This out-migration affected mainly the districts of Northeastern and Northwestern Ontario, as well as most counties in Eastern Ontario (except Carleton County, which had a favourable net balance in in-migrants). Central Ontario attracted the majority of migrants, followed by the Mid-Western Ontario Region. This intensification of internal movements can best be illustrated in this way: during the 1951-61 period (ten years) the net total of these movements was 86,000 whereas in the five-year period 1961-66 it is estimated that the total was 77,000.

Six areas which were listed during the period 1951-61 as gaining appreciably through internal migration are shown in the 1961-66 period as losing a considerable number of their residents. These are the Districts of Algoma, Sudbury, Nipissing and the Counties of Renfrew, Simcoe and Lambton. Essex County, which lost heavily during the fifties, is shown as attracting some migrants in the sixties.

As we can see from the foregoing discussion, it is not easy to assess the magnitude and direction of migration streams, since internal migration is sensitive to constantly changing stimuli, an example of which we have seen in the case of Essex County during the period 1951-1966, or in the case of the northern districts, which at one time were able to attract a great number of new residents only to lose them in the succeeding period. It could also be said that certain areas are prone to migration, as in the case of most counties in Eastern Ontario and the rural counties around Georgian Bay. On the other hand, counties situated around the western shore of Lake Ontario, from Oshawa to Niagara Falls seem to possess a magnetic attraction for migrants. Carleton and Waterloo counties are also able to attract a constant stream of migrants. The case of Carleton County is of special interest since it is surrounded by an area which traditionally loses people.

Internal migration then, as a distributive force, affects the growth or decline of particular areas in Ontario. But the areas in Ontario, which have an attraction for provincial migrants, also attract migrants from other provinces and from abroad. In addition, the natural increase indexes for these areas tend to be above the provincial average because of above-average fertility rates and below-average mortality rates. The cumulative effect of all these trends (migratory and vital statistics) contribute greatly to the

unevenness of population in Ontario on the one hand, and to the rapid growth or decline of particular areas on the other.

Ontario is not unique in this process. Similar trends are observed in the United States, where east-to-west and south-to-north migration streams have been noticeable for years. In England, the London urban agglomeration and the south coast attract a considerable number of migrants, whereas the Midlands and the northern districts are constantly losing members of their population. In Germany the general drift is to the

west, and in Italy from the southern provinces to the northern industrial areas. Even in the socialist countries, where movements of people can be, and are, regulated by the state, some areas seem to be more attractive than others, as for example in the U.S.S.R. the Moscow urban area, and in Poland the central area around Warsaw and the western provinces.

The attraction of urban life intensifies the rural-urban movements. Technological advances in agriculture will free a considerable number of people presently engaged in farm-

ing. Whether they will move to the major urban agglomerations is debatable. Some researchers suggest that the difficulties in living conditions encountered in large areas will make them less desirable places to settle, whereas the medium-sized city offers most of the amenities of city life without the frustrations now prevalent in large centres (expensive housing, costly transportation, etc.). If this prediction of future trends in migration becomes true then we could expect a faster rate of growth for our cities and towns in the range of 20,000-100,000 population.

Appendix

Table 1 — Age Distribution of Ontario Population¹ by Census Years 1901-1966

Age Group	1901		1911		1921		1931		1941		1951		1961		1966	
	000's	% of Total	000's	% of Total	000's	% of Total	000's	% of Total	000's	% of Total	000's	% of Total	000's	% of Total	000's	% of Total
0- 4	224.8	10.3	263.3	10.4	301.8	10.3	307.7	9.0	297.9	7.9	514.7	11.2	740.2	11.9	745.7	10.7
5- 9	230.6	10.6	244.2	9.7	307.9	10.5	333.0	9.7	301.5	8.0	399.3	8.7	674.5	10.8	770.1	11.1
10-14	229.8	10.5	233.8	9.3	275.8	9.4	318.3	9.3	324.8	8.6	325.3	7.1	593.0	9.5	688.3	9.9
15-19	229.7	10.5	240.8	9.5	254.9	8.7	319.0	9.3	339.1	8.9	315.7	6.9	436.9	7.0	599.2	8.6
20-24	216.0	9.9	247.2	9.8	239.9	8.2	291.3	8.5	324.0	8.5	352.4	7.6	387.0	6.2	485.1	7.0
25-29	178.6	8.2	228.4	9.0	238.5	8.1	264.7	7.7	315.7	8.3	387.2	8.4	422.7	6.8	433.9	6.2
30-34	154.9	7.1	195.6	7.7	224.4	7.7	252.2	7.3	286.5	7.6	351.0	7.6	459.8	7.4	447.1	6.4
35-39	144.0	6.6	172.0	6.8	219.5	7.5	246.7	7.2	268.4	7.1	340.8	7.4	469.3	7.5	472.6	6.8
40-44	127.1	5.8	150.1	5.9	187.1	6.4	228.6	6.6	250.3	6.6	302.3	6.6	397.3	6.4	469.4	6.7
45-49	104.4	4.8	133.1	5.3	161.1	5.5	206.2	6.0	232.6	6.1	268.1	5.8	360.8	5.8	391.0	5.6
50-54	89.1	4.1	116.5	4.6	141.2	4.8	177.7	5.2	214.1	5.6	247.5	5.4	309.8	5.0	353.4	5.1
55-59	70.6	3.2	87.2	3.5	112.4	3.8	137.1	4.0	181.8	4.8	210.3	4.6	258.3	4.1	293.3	4.2
60-64	62.7	2.9	72.3	2.9	96.9	3.3	115.0	3.3	149.6	3.9	182.5	4.0	218.5	3.5	244.1	3.5
65-69	47.3	2.1	54.8	2.2	69.8	2.4	92.7	2.7	116.4	3.1	155.1	3.4	180.1	2.9	199.2	2.9
70-74	34.7	1.6	40.8	1.6	48.0	1.6	71.6	2.1	85.9	2.3	116.0	2.5	146.3	2.3	159.1	2.3
75-79	21.3	1.0	26.0	1.0	29.6	1.0	40.0	1.2	55.3	1.5	70.4	1.5	97.7	1.6	108.5	1.6
80+	17.3	0.8	21.2	0.8	24.9	0.8	29.9	0.9	43.8	1.2	58.9	1.3	83.9	1.3	100.9	1.4
Total	2,182.9	100.0	2,527.3	100.0	2,933.7	100.0	3,431.7	100.0	3,787.7	100.0	4,597.5	100.0	6,236.1	100.0	6,960.9	100.0

¹As at June 1st.

Source: DBS, Census of Canada, 1961 for Years 1901-1961.
DBS, Census of Canada, 1966 for Year 1966.

Table 2 — Ratio of Working Age Population of Ontario for Census Years 1931-1966 by Economic Regions and Counties

Regions and Counties	Working Age Population ¹ as Per Cent of Total Population						Regions and Counties	Working Age Population ¹ as Per Cent of Total Population					
	1931	1941	1951	1956	1961	1966		1931	1941	1951	1956	1961	1966
Eastern Ontario							Lake St. Clair						
A — Ottawa Valley:							A — Border:						
Carleton	65.8	69.7	65.3	62.3	60.6	61.5	Essex	63.7	67.6	64.9	61.6	58.3	58.6
Lanark	63.2	63.7	60.0	57.4	56.0	56.7	Kent	62.5	64.5	61.6	59.1	57.6	57.8
Prescott	55.6	58.5	55.9	54.6	54.7	55.2	Sub-total	63.4	66.7	64.1	61.0	58.1	58.4
Renfrew	59.0	62.4	60.9	57.9	55.8	56.1	B — Lambton:						
Russell	53.6	57.4	53.2	52.0	52.1	53.2	Lambton	63.4	64.6	61.8	59.0	57.3	58.2
Sub-total	62.7	66.4	62.9	60.2	58.8	59.7	Sub-total	63.4	64.6	61.8	59.0	57.3	58.2
B — Upper St. Lawrence:							Total — Lake St. Clair	63.4	66.3	63.6	60.5	57.9	58.3
Dundas	61.4	62.7	57.8	57.0	56.0	56.6	Mid-Western						
Frontenac	65.1	67.4	64.5	61.5	60.3	61.5	Huron	62.4	62.3	59.3	57.3	55.8	56.8
Glengarry	57.3	59.1	54.4	52.2	53.2	54.2	Perth	63.2	64.7	61.0	58.3	56.9	57.5
Grenville	62.1	63.3	59.7	58.3	57.2	57.3	Waterloo	64.7	68.2	65.2	61.6	59.8	60.5
Leeds	64.3	64.7	61.0	59.6	58.9	59.5	Wellington	—	65.3	62.3	59.4	57.6	57.8
Stormont	59.7	62.0	59.6	59.0	56.4	57.6	Total — Mid-Western	64.4	65.8	62.8	59.9	58.3	59.0
Sub-total	62.3	64.0	60.9	59.2	58.0	59.1	Georgian Bay						
Total — Eastern Ontario	62.6	65.6	62.2	59.9	58.6	59.5	A — Blue Water:						
Lake Ontario							Bruce	62.0	61.7	57.3	55.6	54.8	55.0
Durham	62.7	63.8	60.4	57.1	56.0	57.1	Dufferin	64.1	63.9	58.7	56.7	56.5	56.8
Haliburton	57.6	60.1	59.3	58.4	57.2	58.1	Grey	62.1	62.9	59.9	58.0	56.7	57.1
Hastings	60.7	63.7	60.3	58.1	56.8	57.7	Simcoe	63.1	64.8	61.0	58.0	56.3	57.3
Lennox & Addington	61.4	61.3	57.2	56.0	55.2	56.0	Sub-total	62.7	63.5	59.9	57.5	56.2	56.8
Northumberland	62.5	63.8	59.2	56.3	55.6	56.4	B — Highlands:						
Peterborough	63.7	65.9	61.4	58.4	57.0	59.0	Muskoka	61.6	64.3	60.7	58.1	56.7	56.9
Prince Edward	61.1	62.0	59.2	57.6	55.4	56.7	Parry Sound	59.2	62.8	57.5	56.1	55.9	55.7
Victoria	63.2	64.1	58.8	56.8	56.2	56.8	Sub-total	60.3	63.4	59.0	57.1	56.2	56.3
Total — Lake Ontario	62.0	63.8	60.0	57.6	56.4	57.5	Total — Georgian Bay	62.2	63.5	59.7	57.4	56.2	56.8
Central							Northeastern Ontario						
Halton	66.0	67.7	63.0	59.8	57.6	58.7	A — Clay Belt:						
Ontario	64.2	67.9	64.2	60.7	58.3	58.8	Cochrane	63.5	64.0	61.0	59.1	57.2	56.9
Peel	65.4	67.2	62.2	60.5	58.8	59.1	Nipissing	57.3	59.9	58.8	57.5	55.9	55.9
York	69.7	72.2	69.4	66.2	63.4	63.4	Timiskaming	64.8	65.2	59.4	57.9	56.8	56.7
Total — Central	69.2	71.7	68.6	65.3	62.6	62.6	Sub-total	62.0	63.3	60.0	58.3	56.6	56.5
Niagara							B — Nickel Range:						
A — Burlington:							Manitoulin	60.3	57.9	56.4	55.6	53.5	52.8
Brant	65.3	67.4	62.9	59.6	61.8	59.3	Sudbury	62.2	63.6	61.7	59.4	57.7	57.6
Wentworth	67.8	70.7	66.4	62.8	60.6	61.3	Sub-total	61.9	62.9	61.2	59.1	57.5	57.3
Sub-total	67.2	70.0	65.6	62.2	60.8	61.0	C — Sault:						
B — Niagara:							Algoma	61.8	64.2	61.8	61.3	57.6	58.0
Haldimand	62.9	64.7	59.6	56.7	55.9	56.1	Sub-total	61.8	64.2	61.8	61.3	57.6	58.0
Lincoln	65.7	68.9	64.4	61.1	59.3	59.9	Total —						
Welland	65.2	69.3	64.7	61.2	59.2	60.0	Northeastern Ontario	61.9	63.4	60.7	59.2	57.1	57.1
Sub-total	65.0	68.6	64.1	60.7	58.9	59.6	Lakehead —						
Total — Niagara	66.4	69.5	65.0	61.6	60.1	60.4	Northwestern Ontario						
Lake Erie							Kenora	63.7	67.1	62.5	60.5	57.3	57.2
Elgin	64.2	65.8	62.7	60.2	58.9	58.9	Rainy River	60.8	63.3	59.0	57.2	54.5	56.0
Middlesex	66.6	68.3	64.6	61.7	59.8	60.4	Thunder Bay	67.1	72.5	65.3	62.2	59.4	60.1
Norfolk	62.8	63.9	62.1	60.3	59.2	58.7	Total —						
Oxford	64.4	65.8	62.2	60.1	58.1	58.3	Northwestern Ontario	65.3	69.9	63.8	61.1	58.3	58.9
Total — Lake Erie	65.2	66.8	63.5	61.0	59.3	59.6	GRAND TOTAL —						
							ONTARIO	65.2	67.6	64.3	61.6	59.7	60.2

¹15-64 year age group.

Source: DBS, Census of Canada for respective years.

Table 3 — Number of Births per 1,000 Women in the Child-Bearing Age Groups, Ontario, Selected Years 1921-1966

Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1921	35.4	150.3	173.4	143.0	98.2	38.8	5.1
1931	35.7	127.5	145.2	114.9	74.1	28.8	3.4
1941	36.8	133.3	137.3	96.3	55.9	19.1	1.7
1946	40.4	166.9	169.7	123.2	70.0	21.7	2.1
1951	60.1	186.4	181.8	125.2	68.1	21.0	1.9
1956	66.9	225.8	205.7	135.6	73.2	22.6	1.6
1957	73.0	228.7	209.0	133.3	74.2	22.6	1.9
1958	70.6	228.8	208.3	133.0	72.8	20.9	1.7
1959	71.7	239.5	214.7	133.3	73.0	20.8	1.7
1960	70.9	241.2	217.1	134.7	71.7	21.6	1.5
1961	69.5	239.8	211.6	134.2	69.8	21.9	1.6
1962	64.5	239.9	210.5	133.9	65.6	21.9	1.4
1963	60.3	233.7	208.1	133.1	66.2	21.1	1.2
1964	57.8	219.7	202.4	128.6	64.6	20.4	1.6
1965	58.3	192.9	180.6	114.5	59.3	17.8	1.5
1966	57.4	171.3	160.2	98.8	52.8	16.2	1.3

Source: DBS, Vital Statistics.

Table 4 — Number of Births per 1,000 Women in the Child-Bearing Age Groups, Canada, Selected Years 1921-1966

Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1921	38.0	165.4	186.0	154.6	110.0	46.7	6.6
1931	29.9	137.1	175.1	145.3	103.1	44.0	5.5
1941	30.7	138.4	159.8	122.3	80.0	31.6	3.7
1946	36.5	169.6	191.4	146.0	93.1	34.5	3.8
1951	48.1	188.7	198.8	144.5	86.5	30.9	3.1
1956	55.9	222.2	220.1	150.3	89.6	30.8	2.9
1957	60.2	227.1	224.1	149.4	90.7	30.7	2.8
1958	59.2	226.5	223.3	147.9	87.6	28.9	2.7
1959	60.4	233.8	226.7	147.7	87.3	28.5	2.7
1960	59.8	233.5	224.4	146.2	84.2	28.5	2.4
1961	58.2	233.6	219.2	144.9	81.1	28.5	2.4
1962	55.0	231.6	214.6	143.1	77.1	27.6	2.1
1963	53.1	226.0	210.6	140.3	75.8	25.9	2.1
1964	50.2	212.8	203.1	134.9	72.0	25.1	2.1
1965	49.3	188.6	181.9	119.4	65.9	22.0	2.0
1966	48.2	169.1	163.5	103.3	57.5	19.1	1.7

Source: DBS, Vital Statistics.

Table 5 — Births by Order in Family in Ontario, 1927-1966 (Percentage of Total Births)

Year	Birth Order							
	1st	2nd	3rd	4th	5th	6th	7th	8th & More
1927	26.0	20.8	15.6	11.4	8.1	5.6	4.0	8.5
1928	26.7	21.0	15.7	10.8	7.9	5.6	3.9	8.3
1929	27.7	21.5	15.4	10.7	7.4	5.3	3.9	8.1
1930	29.0	21.7	15.0	10.5	7.2	5.1	3.8	7.7
1931	28.5	22.3	15.0	10.5	7.2	5.1	3.7	7.8
1932	27.5	22.6	15.3	10.4	7.3	5.1	3.6	8.3
1933	27.2	22.6	15.7	10.5	7.1	5.1	3.7	8.2
1934	27.9	22.7	15.5	10.3	6.9	5.0	3.6	8.2
1935	30.0	22.5	15.1	10.2	6.9	4.8	3.4	7.5
1936	31.0	22.4	14.8	9.9	6.4	4.6	3.5	7.4
1937	31.8	22.9	14.6	9.6	6.4	4.3	3.2	7.1
1938	33.4	23.5	14.4	9.2	6.0	4.0	3.0	5.5
1939	33.7	23.9	14.7	8.9	5.9	4.0	2.7	6.2
1940	35.6	24.5	14.1	8.4	5.3	3.7	2.4	5.9
1941	37.9	24.6	13.7	8.1	5.0	3.3	2.3	5.2
1942	38.6	25.2	13.6	7.8	4.7	3.2	2.2	4.6
1943	37.5	26.0	14.3	8.0	4.7	3.0	2.0	4.5
1944	34.3	27.1	15.3	8.6	4.9	3.2	2.2	4.5
1945	33.5	27.4	15.5	8.5	5.1	3.2	2.1	4.6
1946	37.0	27.6	15.0	8.0	4.5	2.7	1.7	3.6
1947	39.3	27.1	14.8	7.5	4.2	2.4	1.6	3.2
1948	34.8	28.9	16.0	8.4	4.3	2.7	1.6	3.2
1949	31.5	30.0	17.4	8.7	4.7	2.7	1.7	3.4
1950	30.5	29.6	17.9	9.2	4.9	2.9	1.7	3.3
1951	30.4	28.9	18.3	9.7	5.0	2.8	1.7	3.0
1952	32.2	27.0	18.2	10.1	5.1	2.8	1.6	3.0
1953	31.3	27.2	18.3	10.2	5.4	3.0	1.7	2.9
1954	30.8	26.6	18.6	10.5	5.7	3.1	1.8	3.1
1955	29.8	26.4	18.7	11.0	6.0	3.3	1.8	3.2
1956	29.4	26.2	18.7	11.1	6.1	3.4	2.0	3.1
1957	29.8	25.3	18.9	11.2	6.2	3.5	2.0	3.1
1958	29.4	25.3	18.5	11.5	6.4	3.6	2.1	3.2
1959	28.8	25.7	19.1	11.5	6.6	3.6	2.1	2.6
1960	28.2	25.3	18.9	11.5	6.7	3.9	2.2	3.3
1961	27.6	24.8	19.0	12.0	6.9	3.9	2.3	3.5
1962	27.1	25.1	18.8	12.1	6.9	4.1	2.4	3.5
1963	27.0	24.9	18.9	12.2	7.1	4.1	2.3	3.5
1964	27.9	25.0	18.7	11.8	6.9	4.0	2.3	3.5
1965	30.8	25.0	17.9	11.2	6.3	3.7	2.1	3.0
1966	34.1	26.0	16.8	10.0	5.5	3.1	1.7	2.6

Source: Original statistics for the years 1927-1951 were obtained from the Registrar-General's Office. Original statistics for the years 1952-1957 from "Report relative to Registration of Births, Marriages and Deaths in the Province of Ontario".

1958-1965 — DBS, Vital Statistics.

Table 6 — Ontario's Population 1839-1968

Year	Population	Year	Population	Year	Population
1839	409,048	1882	1,942,337	1925	3,111,000
1840	432,159	1883	1,961,446	1926	3,164,300
1841	455,688	1884	1,980,556	1927	3,219,000
1842	487,053	1885	1,999,665	1928	3,278,000
1843	n.a.	1886	2,018,774	1929	3,334,000
1844	n.a.	1887	2,037,884	1930	3,386,000
1845	n.a.	1888	2,056,993	1931	3,431,700
1846	n.a.	1889	2,076,102	1932	3,473,000
1847	n.a.	1890	2,095,212	1933	3,512,000
1848	725,879	1891	2,114,321	1934	3,544,000
1849	n.a.	1892	2,121,184	1935	3,575,000
1850	n.a.	1893	2,128,046	1936	3,605,500
1851 } 1852 }	952,004	1894	2,134,909	1937	3,637,000
1853	n.a.	1895	2,141,771	1938	3,672,000
1854	n.a.	1896	2,148,634	1939	3,708,000
1855	n.a.	1897	2,155,497	1940	3,747,000
1856	n.a.	1898	2,162,359	1941	3,787,700
1857	n.a.	1899	2,169,222	1942	3,884,000
1858	n.a.	1900	2,176,084	1943	3,915,000
1859	n.a.	1901	2,182,947	1944	3,963,000
1860 } 1861 }	1,396,091	1902	2,194,000	1945	4,000,000
1862	n.a.	1903	2,217,000	1946	4,093,000
1863	n.a.	1904	2,246,000	1947	4,176,000
1864	n.a.	1905	2,289,000	1948	4,275,000
1865	n.a.	1906	2,299,000	1949	4,378,000
1866	n.a.	1907	2,365,000	1950	4,471,000
1867	1,525,000	1908	2,412,000	1951	4,597,600
1868	1,548,963	1909	2,444,000	1952	4,788,000
1869	1,572,926	1910	2,482,000	1953	4,941,000
1870	1,596,889	1911	2,527,292	1954	5,115,000
1871	1,620,851	1912	2,572,000	1955	5,266,000
1872	1,651,088	1913	2,639,000	1956	5,404,900
1873	1,681,326	1914	2,705,000	1957	5,636,000
1874	1,711,564	1915	2,724,000	1958	5,821,000
1875	1,741,802	1916	2,713,000	1959	5,969,000
1876	1,772,039	1917	2,724,000	1960	6,111,000
1877	1,802,277	1918	2,744,000	1961	6,236,100
1878	1,832,515	1919	2,789,000	1962	6,351,000
1879	1,862,752	1920	2,863,000	1963	6,481,000
1880	1,892,990	1921	2,933,700	1964	6,631,000
1881	1,923,228	1922	2,980,000	1965	6,788,000
		1923	3,013,000	1967	7,149,000
		1924	3,059,000	1968	7,306,000

Table 7 — Population of Ontario as a Percentage of Population of Canada, 1861-1966

Period	Population of Canada 000's	Population of Ontario 000's	Ontario's Population as a Percentage of Canada's Population
1861-1871	3,841	1,621	42.2
1871-1881	4,512	1,927	42.7
1881-1891	5,035	2,114	41.9
1891-1901	5,592	2,183	39.0
1901-1911	7,450	2,527	33.9
1911-1921	9,051	2,934	32.4
1921-1931	10,658	3,432	32.2
1931-1941	11,810	3,788	32.1
1941-1951	14,009	4,598	32.8
1951-1961	18,238	6,236	34.2
1961-1966	20,015	6,961	34.8

Source: Records of Upper Canada Legislative Library, Queen's Park.

D. G. Creighton, British North America at Confederation.

Office of the Registrar General, Ontario.

DBS, Census of Canada 1941.

DBS, Daily, August 19, 1968.

Table 8 — Annual Increase in Population¹ in Ontario and Canada 1941 to 1968

Year	Ontario			Canada ²			Canada ² Excluding Ontario		
	Population	Average Annual Increase		Population (Includes Nfld.)	Average Annual Increase		Population (Includes Nfld.)	Average Annual Increase	
		000's	%		000's	%		000's	%
1941	3,788	41	1.1	11,810	128	1.1	8,022	87	1.1
1942	3,884	96	2.5	11,962	152	1.3	8,078	56	0.7
1943	3,915	31	0.8	12,108	146	1.2	8,193	115	1.4
1944	3,963	48	1.2	12,262	154	1.3	8,299	106	1.3
1945	4,000	37	0.9	12,394	132	1.1	8,394	95	1.1
1946	4,093	93	2.3	12,622	228	1.8	8,529	135	1.6
1947	4,176	83	2.0	12,888	266	2.1	8,712	183	2.1
1948	4,275	99	2.4	13,167	279	2.2	8,892	180	2.1
1949	4,378	103	2.4	13,447	280	2.1	9,069	177	2.0
1950	4,471	93	2.1	13,712	265	2.0	9,241	172	1.9
1951	4,598	127	2.8	14,009	297	2.2	9,411	170	1.8
1952	4,788	190	4.1	14,459	450	3.2	9,671	260	2.8
1953	4,941	153	3.2	14,845	386	2.7	9,904	233	2.4
1954	5,115	174	3.5	15,287	442	3.0	10,172	268	2.7
1955	5,266	151	3.0	15,698	411	2.7	10,432	260	2.6
1956	5,405	139	2.6	16,081	383	2.5	10,676	244	2.3
1957	5,636	231	4.3	16,610	529	3.2	10,974	298	2.8
1958	5,821	185	3.3	17,080	470	2.8	11,259	285	2.6
1959	5,969	148	2.5	17,483	403	2.4	11,514	255	2.3
1960	6,111	142	2.4	17,870	387	2.2	11,759	245	2.1
1961	6,236	125	2.0	18,238	368	2.1	12,002	243	2.1
1962	6,351	115	1.8	18,583	345	1.9	12,232	230	1.9
1963	6,481	130	2.0	18,931	348	1.9	12,450	218	1.8
1964	6,631	150	2.3	19,290	359	1.9	12,659	209	1.7
1965	6,788	157	2.4	19,644	354	1.8	12,856	197	1.6
1966	6,961	173	2.5	20,015	371	1.9	13,054	198	1.5
1967	7,149	188	2.7	20,405	390	1.9	13,256	202	1.5
1968	7,306	157	2.1	20,744	339	1.6	13,438	182	1.4

¹ As at June 1st.² Totals for Newfoundland have been added prior to 1949.

Estimates were based on the Newfoundland Census as follows:

1869 — 146,536; 1874 — 161,374; 1884 — 197,335; 1891 — 202,040; 1901 — 220,984;
1911 — 242,619; 1921 — 263,033; 1935 — 289,588; 1945 — 321,819.

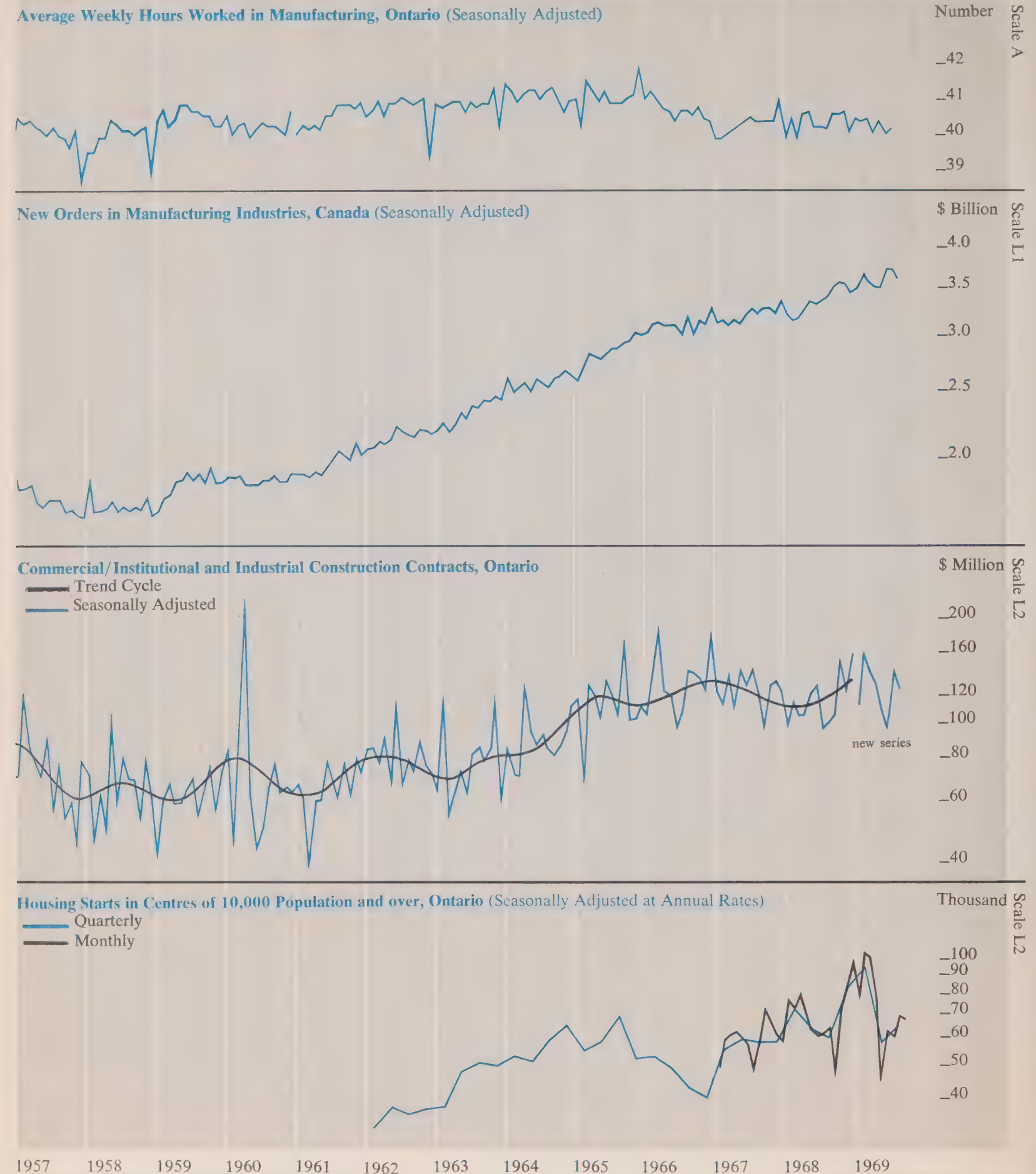
Source: DBS, Census of Canada for Census Years.

DBS, Population Estimates for Intercensal Years.

DBS, Daily, September 12, 1968.

Selected Economic Indicators

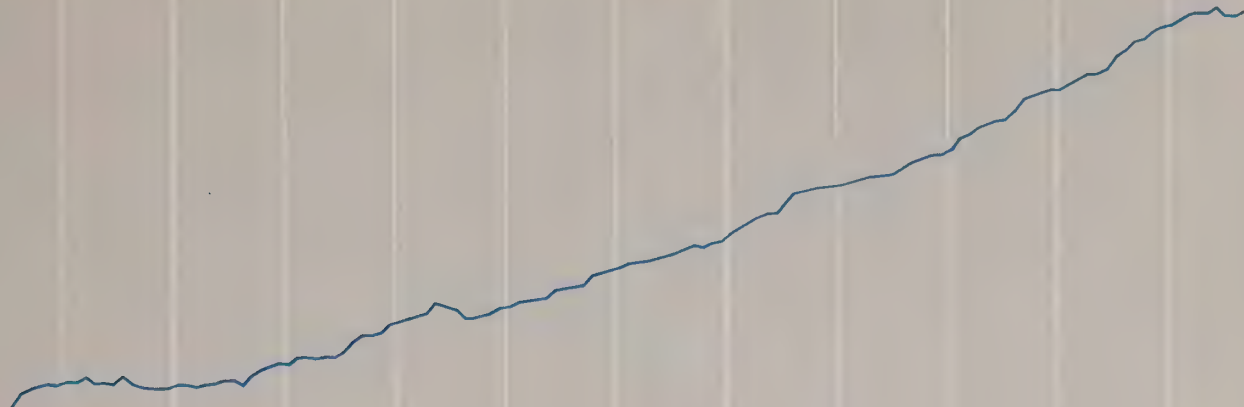
Leading Indicators



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
Scale L1
_30
_25
_20
_15
_14
_13



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index
Scale L2
1956 =
100
_180
_160
_140
_120
_100

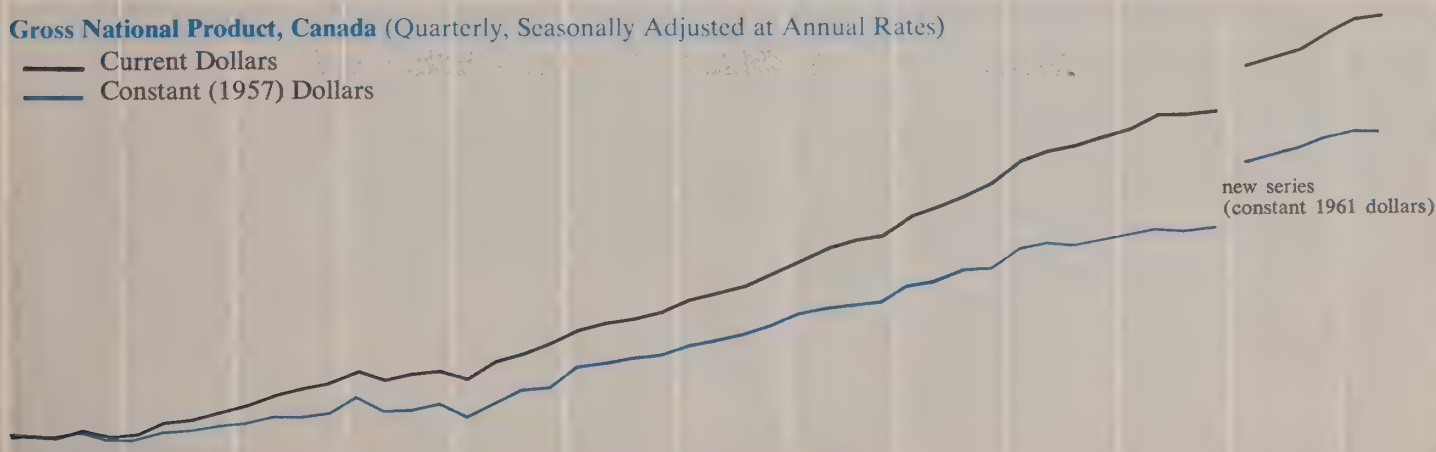


Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

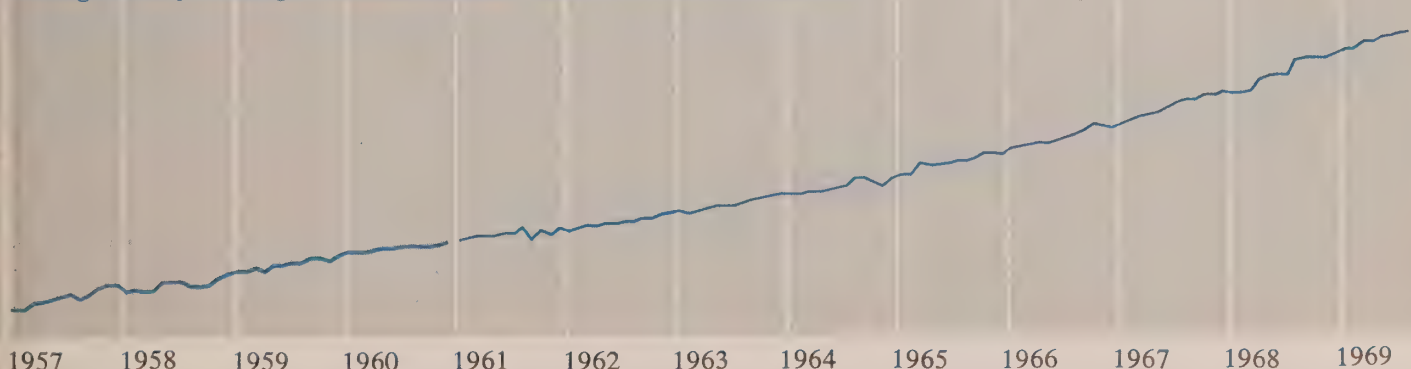
— Current Dollars
— Constant (1957) Dollars

\$ Billion
Scale L1
_70
_60
_50
_40
_35



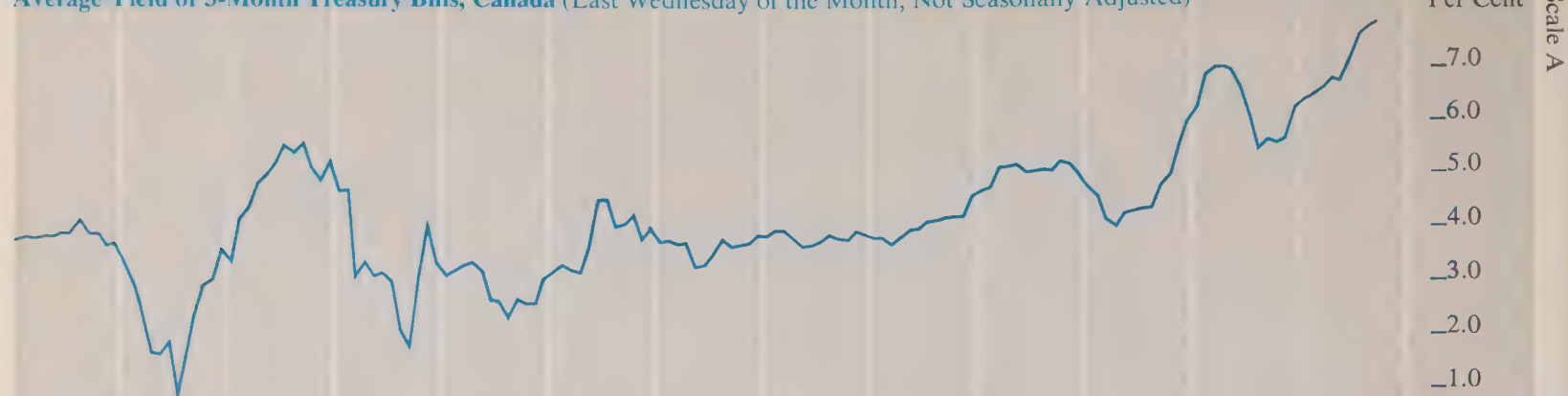
Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Dollars
Scale L1
_3.00
_2.50
_2.00

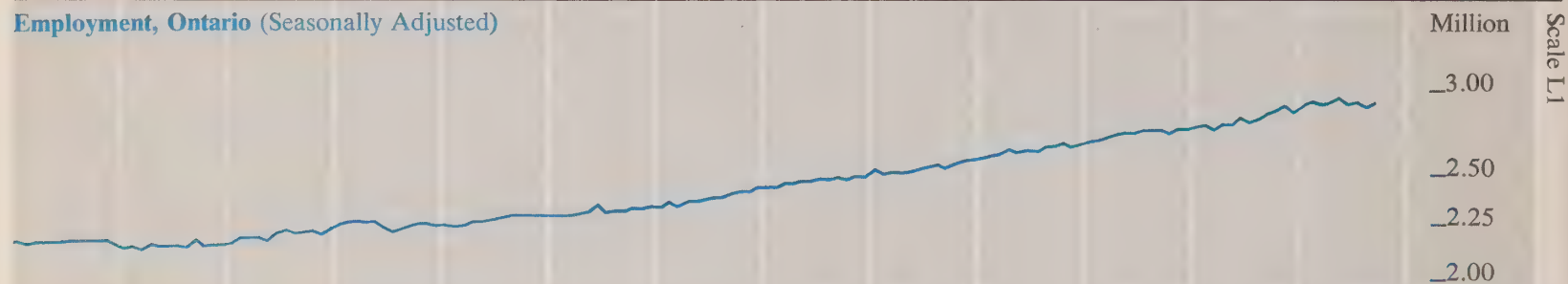


Coincidental and Lagging Indicators

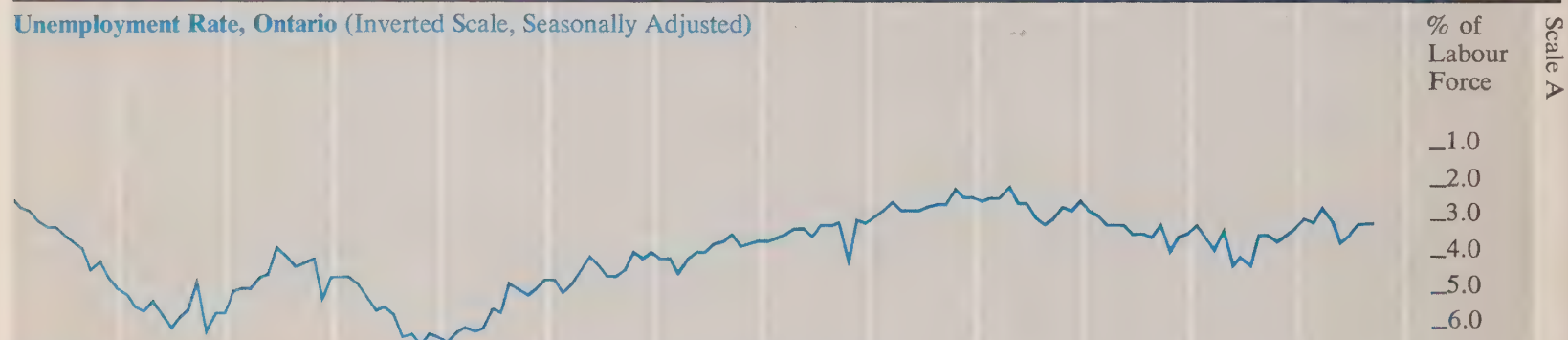
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



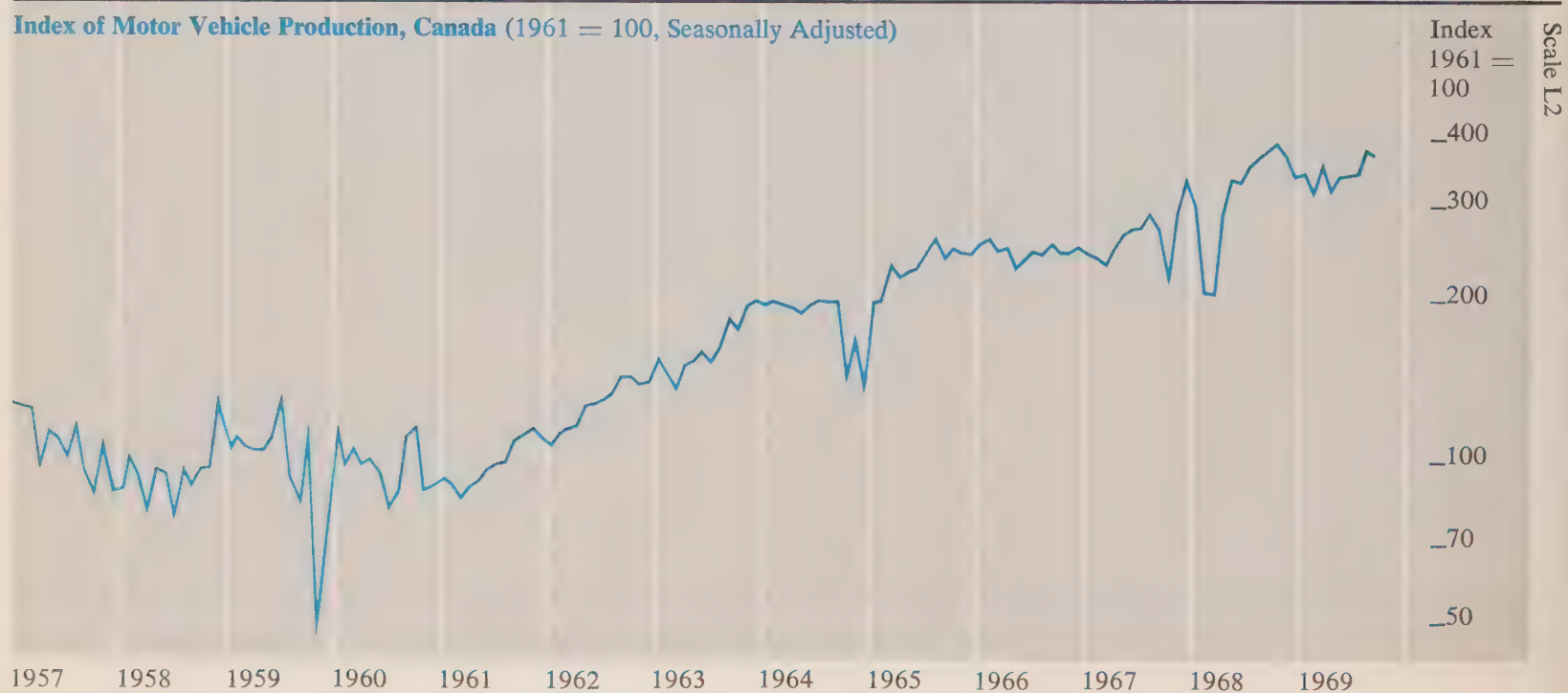
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)



Economic Indicators

Seasonally Adjusted

	1968														1969															
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Aug.	Sept.														
Leading Indicators																														
Average Weekly Hours Worked in																														
Manufacturing	40.2	40.6	40.6	40.7	40.1	40.1	40.3	40.5	40.3	40.5	40.3	40.3	40.0																	
New Orders in Manufacturing Industries ^c	3,420	3,601	3,581	3,577	3,430	3,518	3,693	3,575	3,539	3,564	3,743	3,741	3,634																	
Commercial/Institutional and Industrial																														
Construction Contracts	101.8	107.8	154.4	125.0	155.0	111.9	157.9	140.6	126.1	112.8	93.9	144.0	127.0																	
Urban Housing Starts (Annual Rate)	63,900	48,900	73,400	83,500	98,200	80,800	109,700	102,400	79,900	45,300	63,900	60,800	69,300	67,300																
Money Supply ^c	26,293	26,632	26,768	27,124	27,400	27,669	27,927	28,251	28,331	28,336	28,638	28,324	28,292	28,403																
T.S.E. Industrial Index ^u	169.02	176.37	179.61	187.29	188.93	192.47	185.20	190.58	195.31	197.23	177.34	168.65	175.43	178.15																
Business Failures ^u	28	36	46	48	34	57	59	55	58	48	35	32	51	52																
Business Failures — Liabilities ^u	1.3	1.5	2.1	2.5	1.2	2.9	3.2	2.2	3.2	1.9	2.0	0.9	2.6	4.8																
Coincidental and Lagging Indicators																														
Gross National Product ^c (Annual Rate)		71,920			74,524			76,608			77,432			78,736																
Unclassified Indicators																														
Average Hourly Earnings in Manufacturing																														
3-Month Treasury Bill Rates ^u	2.76	2.78	2.78	2.79	2.81	2.84	2.84	2.88	2.87	2.91	2.93	2.94																		
Cheques Cashed in Clearing Centres ¹	5.48	5.66	5.57	5.66	6.24	6.38	6.43	6.58	6.80	6.74	7.13	7.62	7.69	7.77																
Retail Trade	5,757	5,726	5,783	5,846	5,757	5,820	6,032	6,428	6,243	6,060	6,152	6,458	6,694																	
Labour Force	835	850	851	862	853	879	886	862	866	866	875	884	886	901																
Employed	2,937	2,959	3,002	3,026	2,977	3,010	3,037	3,019	3,038	3,071	3,035	3,028	3,004	3,027																
Unemployed	2,837	2,858	2,890	2,923	2,879	2,928	2,947	2,940	2,948	2,958	2,926	2,935	2,910	2,932																
Unemployed as % of Labour Force	100	101	112	103	98	82	90	79	90	113	109	93	94	95																
Wages and Salaries	3.4	3.4	3.7	3.4	3.3	2.7	3.0	2.6	3.0	3.7	3.6	3.1	3.1	3.1																
Index of Industrial Employment	1,157	1,186	1,198	1,223	1,224	1,239	1,256	1,263	1,270	1,288	1,295	1,321	1,293																	
	125.4	126.7	127.8	128.6	129.3	130.5	131.2	131.5	131.4	131.4	131.0	129.9	128.5	129.4																
Index of Industrial Production^c																														
Total Manufacturing ^c	159.3	161.6	163.7	165.7	166.0	165.8	168.0	171.3	167.7	167.0	167.1	167.1	164.5	165.2																
Non-Durables ^c	158.0	161.3	163.7	165.9	165.7	164.2	167.5	171.3	167.3	168.5	169.0	169.4	166.5	165.9																
Durables ^c	139.8	142.8	144.6	148.0	149.8	147.6	150.8	153.6	150.2	150.6	151.1	151.6	152.4	152.2																
Mining ^c	180.2	183.9	187.0	187.8	185.0	184.5	187.8	192.8	188.2	190.3	190.8	191.0	183.9	182.6																
Electric Power and Gas Utilities ^c	154.3	152.9	154.0	155.1	154.4	159.7	160.6	162.1	157.7	146.0	143.4	140.0	136.2	142.1																
Primary Energy Demand (Annual Rate)	179.0	177.5	178.5	179.7	186.7	189.5	184.3	184.7	186.2	186.6	187.1	189.0	190.1	194.6																
Exports (including re-exports) ^c	55.69	54.83	57.09	57.89	59.81	59.83	58.45	59.49	59.20	58.54	59.12	60.28	58.83																	
Imports ^c	1,103.5	1,115.0	1,176.4	1,203.2	1,201.8	1,204.8	1,243.8	1,295.7	1,194.2	1,233.6	1,214.5	1,209.9	1,212.8	1,307.6																
	963.0	1,092.1	1,127.2	1,084.3	1,106.0	1,149.0	1,194.2	1,178.3	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,230.5																
Unclassified Indicators																														
Foreign Exchange Reserves ^{c,u}	2,590	2,534	2,525	2,672	2,827	2,864	2,820	2,779	2,782	2,760	2,623	2,565	2,594	2,539																
Industrial Materials Price Index ^{c,u}	254.2	253.4	256.8	257.1	258.9	261.4	263.5	264.1	267.7	271.8	270.6	270.5	269.2	272.4																
Consumer Price Index ^{c,u}	120.7	121.1	121.4	121.9	122.3	122.6	122.6	123.2	124.6	124.9	125.9	126.4	126.9	126.6																

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.



Ontario Economic Review

January/February 1970
Volume 8, Number 1

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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The Ontario Economy

The Input-Output Structure of the Ontario Economy

R. H. Frank, S. M. Batrik and D. Haronitis

Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

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Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario

About the Review

The January/February edition of the *Ontario Economic Review* presents an article on the recently completed input-output table for the Ontario economy. Essentially a method of recording detailed statistical information in the form of a table or matrix, an input-output model is of significant value in measuring the impact of changes in final demand for the product of each industry upon the various levels of economic activity within the province.

The first section of this article outlines the conceptual framework of the Ontario input-output model and provides a concise exposition of the underlying methodology. The three basic matrices — the interindustry flow table, the matrix of input-output coefficients and the inverse representing the total requirements table — are examined in the second part of the study and presented in tabular form in the Appendix. The final section provides a summary of the statistical data sources and supplementary estimating procedures used in the construction of the model.

This article was prepared by Mr. R. H. Frank, Director of the Economic Analysis Branch together with Mr. S. M. Batrik and Mr. D. Haronitis of the unit's Input-Output Section within the Economic and Statistical Services Division. The Department also wishes to express its appreciation for the technical advice provided by the Dominion Bureau of Statistics, Quebec Bureau of Statistics and the Advanced Systems Division of the IBM Corporation, Washington D.C., which contributed significantly to the project, particularly its programming aspects.

Indicator Charts, Pages 34-36

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 34-36 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

The Ontario Economy

The Ontario Economy in 1969 and 1970

Looking back over the past year, the performance of Ontario's economy has been both gratifying and disappointing. Gratifying in that unemployment has remained relatively low, productivity has again increased, and incomes have jumped to record highs. Disappointing because inflation, a problem present at the start of 1969, is still unchecked as we enter 1970.

Despite the disruptive impact of inflation and strikes — both of which played a significant role in the economy in 1969 — Ontario enjoyed a reasonable measure of growth and prosperity. An exact measure of the economy's performance has not yet been obtained but indications are that gross provincial product, the total value of final goods and services produced, increased by 9.6 per cent over 1968. This means that the GPP advanced to \$31.5 billion (on the new national accounts basis) from \$28.7 billion in 1968. Prices increased 4.3 per cent and real growth 5.1 per cent. Wages and salaries in Ontario recorded a sizable gain of approximately 12 per cent, while the increase in corporation profits was a more moderate 7 per cent.

Substantial growth in the size of the labour force was surpassed by a 3.8 per cent increase in employment, from 2,830,000 in 1968 to 2,937,000 in 1969, lowering the rate of unemployment to 3.2 per cent from 3.5 per cent in 1968.

The Canadian and Ontario economies did not follow the path predicted early in the year. An anticipated smooth and gentle deceleration from the high rate of growth at the start of 1969 did not materialize. Instead, a series of labour disputes ranging from a costly Toronto construction industry strike-lockout to prolonged strikes in mining and steel manufacturing cut growth severely throughout the summer and autumn. As a result well over one million man-days of output were lost in these specific areas alone. In the closing months of the year there was some recovery, although strict anti-inflationary measures probably moderated this revival of growth.

To understand the cyclical setting for 1970, it is advisable to look back at the economy early in 1969. Canada entered the year with the economy expanding at a clearly excessive pace. This was accompanied by substantial price increases.

A full range of anti-inflationary measures were already in operation, not only in Canada but also in the United States, where

similar problems confronted the economy. In the U.S. credit restraints were tightened which added to the bite imposed by the ten per cent income tax surcharge and other fiscal measures. In Canada, governments at all levels attempted to exercise budgetary restraint since the growth of the service sector (of which government is a part) was a prominent factor in inflation trends. The Government of Ontario struck out against inflation by holding down its spending, despite relentless pressures for further expenditure growth. The federal government imposed the social development tax and kept monetary policy tight.

In the United States, restrictionist policies gradually began to produce a noticeable dampening of the economy's inflationary tendencies. Real economic growth declined steadily, extending the pattern of deceleration started in the autumn of 1968. By the third quarter of 1969, the U.S. growth rate was down to two per cent. Although unemployment rose to four per cent, price pressures were still very strong.

In Canada, efforts to effect a systematic transition to slower growth rates were undermined by labour disputes. While a smooth deceleration might have been forthcoming, the added burden of strike activity reduced economic growth in the second quarter of 1969 to a standstill. Manufacturing, mining and construction were particularly hard hit. The third quarter of the year saw only a mild recovery. Weaknesses also appeared elsewhere in the economy, particularly in housing starts and in exports.

This pattern of growth carried over into the mid-summer months of 1969, as the economy was still plagued by labour disputes. In addition to strikes in construction, nickel and iron ore, an 80-day work stoppage at Stelco seriously hampered the growth of industrial output by interfering with the flow of basic steel and steel products.

An unsatisfactory level of industrial output was accompanied by continued weakness in housing construction. Urban housing starts in Ontario, seasonally adjusted at annual rates, declined to 58,600 and 65,500 in the second and third quarters respectively after reaching a level of 97,000 units in the first quarter of 1969. Nevertheless, in the period January-September, the total number of starts was 8.6 per cent higher than in the corresponding time-span in 1968. However, Toronto, which accounts for roughly half of all urban housing starts, recorded a loss

of approximately 6.9 per cent. Starts in most other major urban areas were up in varying degrees with Ottawa, Windsor, Oshawa and Sudbury experiencing particularly large increases. For the year 1969 as a whole, housing starts for all areas of Ontario were approximately 80,700 as compared with 80,375 in 1968.

Business investment followed a unique path during 1969. Surveys indicated bullish intentions throughout most of the year, at first seemingly in response to the need to "catch up" and to the favourable surge in profits at the close of 1968, but later apparently due to fears of further inflation. Only recently has it come to light that strikes in construction and tight financial conditions resulted in some postponements of projects. Still, a marked overall gain was recorded in Ontario.

Substantial increases in non-residential construction prices, a succession of very high wage increases and price rises elsewhere in the economy heightened concern over inflation throughout the year, despite some signs of moderation in the pace of economic activity. In June, discriminatory federal tax penalties were imposed upon construction of commercial buildings in urban centres. This policy affected Ontario in particular. However, weaknesses in construction activity appear to have resulted from labour problems and financing difficulties rather than tax measures.

The question of inflation received top priority during the year. Just after mid-year, the newly established Prices and Incomes Commission issued a series of proposals for voluntary price restraint on the part of industry, government and labour. This voluntary approach did not show any immediate signs of achieving acceptance. Negotiated wage increases remained at a high annual rate of approximately eight per cent. The annual increases in the consumer price index reached five per cent at mid-year and later settled back to a still-inflationary level in excess of four per cent.

Early in the summer months the rapid ascent of meat prices attracted considerable attention as the index for food rose over two per cent from May to June. Although beef prices settled down soon thereafter, food prices remained high relative to the previous year. A large price increase was recorded for the year in the wholesale price index as well. Near year-end settlement of the steel strike appeared to trigger increases in selected steel

prices. These continuing price pressures prompted the federal government to hint that price and wage controls as well as further tax measures would be considered if the current rate of inflation continued.

Ontario's strength in 1969 came from residential construction activity and exports, even though both sectors showed distinct signs of weakening throughout the year. The estimated value of actual housing expenditure was \$1.3 billion in accordance with earlier investment intentions. Exports for Canada as a whole were 9.5 per cent higher than last year; retail trade in Ontario increased by more than eight per cent.

Turning to the outlook for 1970, one major issue divides forecasters on the current state of the North American economy. While most agree that growth will once again decelerate under the weight of anti-inflationary monetary and fiscal policies, the argument revolves around the degree of deceleration and unemployment which will accompany it. In the U.S., some suggest that the economy has already entered a period of no economic growth, while others expect that the current pause is just that, a

pause, to be followed by a resumption of economic growth later in 1970.

The economic climate in the United States is very important to Canada and Ontario since we rely heavily on exports to the U.S. and depend upon favourable conditions in foreign markets generally. In addition, changing monetary policies both in Canada and the U.S. will have important repercussions for us.

Estimates of the growth of real output in the United States in 1970 range from zero to nearly four per cent. On the whole, however, it appears that U.S. growth will cease over the first half of 1970, but will recover at mid-year, achieving an overall growth rate of approximately two per cent. Price pressures may begin to ease about that time.

Canada will probably not face a slowing of economic growth to the same extent in the first half of 1970, primarily because we have already gone through one downward readjustment in mid-1969. After experiencing a modest revival of economic growth in the fourth quarter of 1969, the first two quarters of 1970 should see a return to a positive but reduced rate of economic growth. If the U.S. can weather its pause without too much difficulty, Canada should continue to enjoy

some forward momentum in the economy. Throughout this period it is expected that Canadian monetary and fiscal policies will continue to maintain an anti-inflationary stance — perhaps in the face of steadily rising unemployment. If so, a basis for future price moderation may be established before economic growth begins to increase once again. Prices will still, however, continue to rise over 1970 and it may not be until early 1971 that any significant reduction can be anticipated.

By mid-year, the U.S. economy will reverse its downward trend as an easing of monetary policy and the termination of the five per cent income tax surcharge lead to a resumption of economic growth. Corresponding easing in the monetary picture in Canada, along with some improvement in export prospects, should also produce a shift to acceleration in economic activity.

If economic dislocation is minimal during the critical transition period of 1970, Ontario can expect a rate of economic growth of approximately 7.2 per cent in 1970. Prices should account for approximately 3.9 per cent of this increase while the volume of real output should rise by about 3.3 per cent.

The Consumer Price Index¹, Canada, Ottawa and Toronto, December 1969/December 1968

	All Items	Food	Housing	Clothing	Transportation	Health and Personal Care	Recreation and Reading	Tobacco and Alcohol
Canada								
1969	127.9	129.8	127.6	126.4	122.0	136.8	128.1	126.3
1968	122.3	124.5	121.0	123.4	115.7	129.4	123.3	121.3
% Change	4.6	4.3	5.5	2.4	5.4	5.7	3.9	4.1
Ottawa								
1969	125.8	131.1	117.1	128.5	120.0	139.8	135.6	132.2
1968	120.2	125.2	111.5	124.8	116.9	131.8	125.6	125.1
% Change	4.7	4.7	5.0	3.0	2.7	6.1	8.0	5.7
Toronto								
1969	126.6	129.9	119.8	130.1	128.2	135.3	124.2	130.2
1968	121.5	123.8	116.5	127.2	119.5	128.8	120.3	123.6
% Change	4.2	4.9	2.8	2.3	7.3	5.0	3.2	5.3

¹Based on 1961 = 100.

Source: DBS, Price Movements.

R. H. Frank, S. M. Batrik and D. Haronitis
Department of Treasury and Economics

Reflecting the increasing need for detailed quantitative analyses of major sectors of the Ontario economy, the Economic Analysis Branch of the Economic and Statistical Services Division has initiated a continuing econometric program designed for the formulation and testing of economic models which incorporate both forecasting and policy evaluation features.

During the past two years, the Division's economic research activity has concentrated on the development of an input-output table for the province and the design of a system of provincial economic accounts to be integrated subsequently with an econometric model.

The present study describes in detail the recently completed input-output table which portrays the intricate structural framework of Ontario's economy in terms of interindustry flows of goods and services and their interaction with the final demand sector.

The first section of this article outlines the conceptual framework of the Ontario input-output model and provides a concise exposition of the underlying methodology. The three basic matrices – the interindustry flow table, the matrix of input-output coefficients and the inverse representing the total requirements table – are examined in the second part of the study and presented in tabular form in the Appendix. The final section provides a summary of the statistical data sources and supplementary estimating procedures used in the construction of the model.

I THE ONTARIO INTERINDUSTRY MODEL

Input-output analysis is essentially a method of recording detailed statistical information in the form of a table or matrix, which portrays the flow of goods and services among the various sectors of the economy. The first step in constructing an interindustry table is to divide the economy into a number of sectors on the basis of input and/or output homogeneity. The sectors are then arranged in the same order along the rows and columns of the table. The second step is to fill in the cells of the table by utilizing available statistical information. Each row of the table indicates the total output of each sector and its distribution among various other sectors to meet intermediate and final demand. Each column indicates the inputs required by each sector to produce a given

level of output. The interindustry model is based on two fundamental identities. The first is that the total output of an industry – the sum of each row – is equal to its total input – the sum of each column. The second identity is that the sum of the primary inputs – wages and salaries and other value added – is equal to the sum of the final demands.

The Ontario input-output model can be represented by a set of equations as follows: let x_{ij} denote the output of sector i used as input by sector j ; Y_i domestic final demand for the product of sector i ; X_i total production of sector i ; E_i and M_i total exports and imports of the product of sector i respectively, then:

$$x_{i1} + x_{i2} + \dots + x_{in} + Y_i + T_i = X_i$$

or

$$(1) \sum_j x_{ij} + F_i = X_i \quad (i, j = 1 \dots n)$$

where $T_i = E_i - M_i$ denotes the net trade balance of the product of sector i and $F_i = Y_i + T_i$ represents total final demand for the product of sector i net of imports.

Equation (1) shows that the total output of sector i is equal to the amount of product i used by itself and various other sectors as input plus the amount delivered to final consumers. Summing over all i , we obtain:

$$(2) \sum_i \sum_j x_{ij} + \sum_i F_i = \sum_i X_i$$

Equation (1) was obtained by summing the row elements of the matrix. If we sum the column elements we can write:

$$x_{1j} + x_{2j} + \dots + x_{nj} + V_j = X_j$$

or

$$(3) \sum_i x_{ij} + V_j = X_j$$

where V_j represents the value added generated by sector j , which includes wages and salaries, profits, dividends etc., and X_j denotes total inputs used by sector j . Summing equation (3) over all j yields:

$$(4) \sum_j \sum_i x_{ij} + \sum_j V_j = \sum_j X_j$$

Combining equations (2) and (4) we can derive the provincial accounts identity:

$$(5) \sum_j V_j = \sum_i F_i$$

since

$$\sum_i X_i = \sum_j X_j \quad \text{and} \\ \sum_j \sum_i x_{ij} = \sum_i \sum_j x_{ij}$$

The left-hand side of equation (5) shows total payments to factors of production or gross provincial income, whereas the right-hand side represents total expenditure on goods and services or gross provincial product. Hence gross provincial income equals gross provincial product (net of imports). Interindustry transactions are eliminated in provincial accounting and may be described as non-GPP items.

The input-output matrix as formulated in equations (1) to (5) represents a static equilibrium model in the sense that its variables balance out, without surplus or deficit – as indicated in equations (1) and (3) – and reflects the structure of the economy at a given point of time. Demand balances supply at the price and/or income of the static equilibrium position.

Within the context of the Ontario model it is assumed that the national price index for commodity i during 1965 represents the equilibrium price for that year.

The usefulness of an input-output model is basically twofold. In the first place, the interindustry table serves as a device for storing important information concerning the structure of production and the interdependency of the various producing sectors in the economy. Secondly, the input-output model can be used to estimate total output requirements necessary to meet final demand targets by solving the system of equations (1) for the output vector X .

Before proceeding to the solution of the input-output model it is necessary to state explicitly the basic underlying assumptions:

(a) It is assumed that each productive sector produces a single commodity, which implies that joint production is ruled out. However, in practice this assumption is not met as each sector frequently produces two or more products, one of which is primary while the rest are secondary to the main activity. Hence, to implement this assumption it is necessary to adjust sectoral output by transferring the secondary products of each sector to those sectors to which they are primary¹.

¹The method of adjustment used in the Ontario model is described below.

(b) The production function which relates the output X_j of the j th sector to its inputs x_{ij} is assumed to be homogeneous of degree one, which implies that constant returns to scale prevail in the production process.

(c) The final assumption states that each input x_{ij} is required in fixed proportion to output. Hence we can write:

$$(6) \quad x_{ij} = a_{ij} X_j$$

The fixed coefficients $a_{ij} = x_{ij}/X_j$ indicate the input units required per output unit, and represent the state of technology in the economy.

In addition to the basic assumptions stated, the following conditions or constraints must be satisfied to ensure internal consistency of the model.

(a) It is necessary that the net output of each producing sector be non-negative. The net output of the i th sector is defined as the difference between gross output X_i and the sectors intermediate demand for its own product denoted by x_{ii} .

Hence:

$$(7) \quad X_i - x_{ii} \geq 0 \text{ for all } i$$

It is possible that the entire output of a particular sector is absorbed as input in the production process. However, within the framework of a static equilibrium model, such as the Ontario input-output table, it is inconsistent for intermediate demand of sector i for its own product to exceed the sector's gross output.

(b) It is implicit from equation (7) that $a_{ii} < 1$ i.e. the feedback coefficients¹ must be less than unity.

Under these assumptions the solution of the model can be derived as follows: by rearranging the set of equations (1) and substituting $x_{ij} = a_{ij} X_j$ from equation (6) we obtain:

$$(8) \quad \begin{array}{rcl} (1 - a_{11}) X_1 - a_{12} X_2 - \dots - a_{1n} X_n & = & F_1 \\ - a_{21} X_1 + (1 - a_{22}) X_2 - \dots - a_{2n} X_n & = & F_2 \\ \cdot & & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \\ - a_{n1} X_1 - a_{n2} X_2 - \dots + (1 - a_{nn}) X_n & = & F_n \end{array}$$

In matrix notation this may be written as:

$$(9) \quad \begin{bmatrix} (1 - a_{11}) & -a_{12} & \dots & -a_{1n} \\ -a_{21} & (1 - a_{22}) & \dots & -a_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ -a_{n1} & -a_{n2} & \dots & (1 - a_{nn}) \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ \cdot \\ \cdot \\ X_n \end{bmatrix} = \begin{bmatrix} F_1 \\ F_2 \\ \cdot \\ \cdot \\ F_n \end{bmatrix}$$

or

$$(10) \quad (\mathbf{I} - \mathbf{A}) \mathbf{X} = \mathbf{F}$$

where \mathbf{I} is the identity matrix of order $(n \times n)$ while \mathbf{A} is the $(n \times n)$ square matrix of technical coefficients; \mathbf{X} is the $(n \times 1)$ vector of sectoral output levels and \mathbf{F} is the $(n \times 1)$ vector of total final demands. Assuming that $|\mathbf{I} - \mathbf{A}| \neq 0$ and premultiplying equation (10) by $(\mathbf{I} - \mathbf{A})^{-1}$ the solution of the model is given by:

$$(11) \quad \mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{F}$$

If the final demand vector \mathbf{F} is determined exogenously, equation (11) yields the total output vector \mathbf{X} , i.e., the level of production required by each sector to satisfy a given final demand target.

Net Trade Balance

Due to lack of statistical information on interprovincial and international trade flows, the net trade balance for each sector was estimated as a residual item by making use of the balance equation (1), which can be written as:

$$(12) \quad T_i = X_i - \left(\sum_j x_{ij} + Y_i \right)$$

The sum of intermediate demand,

$$\sum_j x_{ij}$$

and domestic final demand Y_i provides an estimate of total output that must be produced by sector i to meet direct and indirect requirements of the Ontario economy. These estimated total output requirements are compared with actual total output X_i , the difference being the net trade balance, T_i , for the product of sector i . A positive value of T_i indicates that the province is a net exporter of product i , whereas a negative value shows that the province is a net importer of that product.

Valuation Problem

One of the major problems arising in the construction of an input-output table is the valuation of distributive costs for wholesale and retail trade, transportation and storage. For purposes of interindustry analysis, there are two alternative valuation methods for distributing trade and transportation margins among all sectors of the economy, namely, the producers' price system and the purchasers' price system. In the producers' price system, each sector is treated as paying trade and transportation costs directly to the trade and transportation sectors on all its purchases of inputs. Hence, within the conceptual framework of this method, distribution costs are charged to the purchasers of commodities. In the purchasers' price system, on the other hand, trade and transportation costs are allocated directly to the producers of each commodity.

Adopting the producers' price system requires that the value of all inputs as recorded in the Census of Manufactures be adjusted accordingly. However, due to lack of information on distributive costs, it was assumed that the national ratios of the cost items to the purchaser value of each product are applicable to Ontario. The method of conversion is summarized in the following equations:

Let $\mathbf{Z}^* = [z^*_{ij}]$ represent the national input-output matrix valued at purchasers' prices,

¹The feedback coefficient a_{ii} of sector i is defined as the amount of its own output required as input for producing one unit of output.

and $\mathbf{Z} = [z_{ij}]$ the same matrix valued at producers' prices. Then:

$$(13) \quad \mathbf{D} = \mathbf{Z}^* - \mathbf{Z}$$

where $\mathbf{D} = [d_{ij}]$ represents the distributive costs and all other margins which are included in the i th product and purchased by sector j .

Dividing each element of matrix \mathbf{D} by the corresponding element of matrix \mathbf{Z}^* the matrix $\mathbf{R} = [r_{ij}]$ is derived representing the ratios of the total value of distributive costs and trade margins to the value of each product at purchasers' prices.

Under the assumption that $\mathbf{R} = \mathbf{K}$, where $\mathbf{K} = [k_{ij}]$ is the total margins coefficients matrix for Ontario, the aggregate value of trade and transportation margins for each industry was estimated by multiplying each element of the matrix \mathbf{K} by the corresponding element of the Ontario input-output matrix, valued at purchasers' prices and denoted by $\mathbf{X}^* = [x^*_{ij}]$. Thus, the derived Ontario table at producers' prices, denoted by $\mathbf{X} = [x_{ij}]$ is represented by the following equation:

$$(14) \quad \begin{bmatrix} x^*_{11}(1 - k_{11}) + x^*_{12}(1 - k_{12}) + \dots + x^*_{1n}(1 - k_{1n}) \\ \vdots \\ x^*_{n1}(1 - k_{n1}) + x^*_{n2}(1 - k_{n2}) + \dots + x^*_{nn}(1 - k_{nn}) \end{bmatrix} = \mathbf{X}$$

The total value of these margins,

$$\sum_i x^*_{ij} k_{ij}$$

for sector j was subsequently disaggregated into the trade margin and transportation costs, using the national ratio of each component to the total.

Secondary Products

The Census data are compiled on the basis of the Standard Industrial Classification which defines each industry in terms of a group of establishments engaged in the production of a principal commodity. However, many establishments within an industry frequently produce secondary products which are primary to other industries. In order to ensure homogeneity of the sectoral production functions, it is imperative that the secondary products be identified and reallocated.

The ideal method for the reallocation of secondary products is to transfer them to industries within which they are considered, by definition, primary products. As the

transfer of secondary products results in a change of the input structure this would necessitate a modification of the input distribution of the table to account for the inputs used in the production of secondary products. Since the data required for the implementation of this method are not available, only the output adjustments were feasible. The secondary products are reallocated as inputs to the industries for which they are primary and simultaneously added to the output of these industries. In fact, this procedure deals with secondary products as though they were purchased and made available for distribution by the primary industry. It should be noted that this limited adjustment procedure has also been used in the construction of the input-output model of the United States and other countries.

II DESCRIPTION OF THE BASIC TABLES

The input-output technique of organizing and analyzing the massive economic data

available reveals in synoptic fashion the basic economic variables and their interrelationships. It presents in quantitative form the complexity of the Ontario economy and its advanced industrial base with virtually every type of economic activity represented. In addition, the model reveals not only the diversity of the Ontario economy, but also the high degree of interdependency among different sectors.

Three basic tables of the Ontario input-output model — the transactions flow matrix, the direct requirements and the total requirements tables — are presented in the Appendix of this article.

Transactions Flow Table

Table I shows in thousands of 1965 dollars all the economic transactions in Ontario for that year. Each entry represents a sale or purchase depending on whether the table is read by row or column. The row entries of the table show how the output of a particular sector was distributed to all other in-

dustries and final consumers in the economy. The direct relationship between the production of an industry and its sales to final users varies considerably. For example, while the motor vehicle industry sells close to 70 per cent of its total output to final users, the mining industry delivers over 70 per cent of its output to other industries as raw material or intermediate input. In some industries the value of total output is not sufficient to satisfy the intermediate demand of other industries. For example, total intermediate demand for the output of synthetic textiles (No. 15) amounts to \$123 million, while total provincial output of this industry is \$59 million with the difference compensated for by imports either from other provinces and/or the rest of the world.

As shown in Table I, 20 industries out of 49 sell over 50 per cent of their total output to final consumers. It is essential for economic policy planning not only to distinguish between intermediate and final users of the output of each sector, but also to identify the individual recipient sector. It should be noted that there are considerable differences among sectors in the degree of diversity of their intermediate market pattern. For example, while grain mills (No. 5) and utilities (No. 47) both sold over 50 per cent of their production to other industries, the latter sold its output to almost every sector, while grain mills delivered their output to a very small number of industries. Thus, the intermediate market pattern shown in the Ontario input-output table reflects the demand, price levels and product-mix existing during the base year.

While the row entries in the flow table show the output distribution for each sector, the columns for each sector indicate the amount of inputs required from all other sectors as well as the amount of productive factors needed to produce a given level of output. For example, the iron and steel industry (No. 25), required \$118 million of mineral products, \$194 million of its own product and \$15 million of services, etc. to produce \$1,025 million of steel and iron products.

Direct Requirements Table

Table II in the Appendix relates each of the inputs of an industry to its total output. The structure of production of an economic system, as represented by the direct requirements table, reflects essentially the underlying technology of the economy. The entries

shown in the table are therefore referred to as "technical coefficients".

Each column in Table II shows the inputs that the industry named at the top of that column required from other industries to produce a dollar's worth of output. For example, to produce a dollar's worth of output, the iron and steel industry (No. 25) requires 11 cents worth of products from the mining industry (No. 2), 19 cents worth of its own production, and services valued at 14 cents, etc.

The information contained in Table II reflects the complex nature of Ontario's economic structure. Almost all industries require inputs from at least 20 different industries. Further insight into the industrial interdependence may be gained by examining the feedback coefficients which represent that portion of the output of a particular sector used in its own production. The higher the value of input produced within the same industry the lower the degree of interaction the industry has with other sectors. For example, the agricultural sector produces 33 per cent of its own requirements while the trade, transportation and storage industries supply only 10 per cent of their own input requirements.

The accompanying table shows the entries on the principal diagonal with a ranking of the sectors according to their degree of specialization and interdependency.

Structural Inverse Matrix

While the direct requirements table indicates how much is required by different industries to produce a dollar's worth of output, the structural inverse matrix shows the amount of output required both directly and indirectly from the industry named in each row for each dollar of deliveries to final demand by the industry named at the head of the column. This table thus permits a quantitative evaluation of the impact of induced changes in final demand on the various industries of the economy.

Although the structural inverse matrix is more convenient for calculating total requirements, the direct requirements table is sometimes preferred since it permits flexibility in computation and allows for modification of the underlying relationships. In addition, Table II can be used in conjunction with Table III to split the total requirements into their direct and indirect components. For example, the direct effect of a unit change in final demand for food products is obviously one dollar. However, as the structural matrix

Ranking of Ontario Industries By Percentage of Total Output Consumed Within the Producing Industry, 1965

(Valued at Producers' Prices in \$000)

	I-O Rank No.	Industry	Intra-industry Consumption	Total Output	Intra-industry Consumption as a Percentage of Total Output
1	26	Other Primary Metals Industries	244,322	745,129	32.79
2	14	Cotton Yarn and Cloth	17,230	58,742	29.33
3	31	Motor Vehicles and Aircraft	1,011,110	3,486,792	29.00
4	19	Sawmills	24,367	84,206	28.94
5	22	Pulp and Paper Mills	152,323	586,059	25.99
6	7	Sugar and Confectioneries	37,207	144,404	25.77
7	3	Meat and Poultry	140,766	641,117	21.96
8	23	Paper Products	92,094	437,824	21.03
9	13	Leather and Leather Products	34,731	178,063	19.50
10	4	Dairy Products	91,401	474,177	19.28
11	38	Other Non-metallic Mineral Products	41,128	221,148	18.60
12	18	Other Textile Mills	65,449	353,138	18.53
13	25	Iron and Steel Mills	194,655	1,051,243	18.52
14	47	Utilities	88,461	484,700	18.25
15	43	Other Chemical Industries	170,628	992,485	17.19
16	8	Other Food Industries	131,880	796,498	16.56
17	32	Other Transportation Equipment	26,937	163,802	16.44
18	11	Tobacco and Tobacco Products	24,968	172,462	14.48
19	12	Rubber Products	53,289	387,082	13.77
20	35	Communication Equipment	71,906	546,021	13.17
21	37	Clay, Lime and Cement	39,999	309,985	12.90
22	15	Synthetic Textiles	21,648	203,897	10.62
23	21	Other Wood Industries	17,605	172,441	10.21
24	48	Communications and Other Services	605,626	6,843,310	8.85
25	44	Miscellaneous Manufacturing Industries	44,552	541,845	8.22
26	39	Petroleum Refineries and Coal Products	44,639	567,456	7.87
27	29	Other Metal Fabricating Industries	126,496	1,641,560	7.71
28	40	Plastics and Synthetic Resins	13,283	175,331	7.58
29	1	Agriculture, Forestry and Fishing	113,606	1,706,750	6.66
30	46	Transportation, Storage and Trade	272,076	4,148,317	6.56
31	5	Grain Mills	17,083	295,328	5.78
32	41	Paint and Varnish	6,765	120,334	5.62
33	2	Mining	44,924	830,380	5.41
34	17	Clothing Industries	10,479	262,133	4.00
35	16	Knitting Mills	4,299	121,548	3.54
36	24	Printing and Publishing	20,123	584,097	3.45
37	10	Distilleries, Breweries and Wineries	9,788	288,876	3.39
38	20	Furniture and Fixtures	8,273	262,863	3.15
39	42	Pharmaceuticals and Medicines	3,810	127,220	2.99
40	36	Other Electrical Equipment	3,368	189,909	1.77
41	30	Miscellaneous Machinery	6,233	488,866	1.27
42	33	Electrical Appliances	2,746	319,529	0.86

Ranking of Ontario Industries By Percentage of Total Output Consumed Within the Producing Industry, 1965 (continued)
(Valued at Producers' Prices in \$000)

Rank	I-O No.	Industry	Intra-industry Consumption	Total Output	Intra-industry Consumption as a Percentage of Total Output
43	34	Electrical Industrial Equipment	660	364,983	0.18
44	45	Construction, Maintenance and Repair	1,811	3,176,718	0.06
45	28	Metal Stamping, Pressing and Coating	15	416,656	*
46	6	Biscuits and Bakeries	0	231,685	0.00
47	9	Soft Drinks	0	81,209	0.00
48	27	Fabricated and Structural Metals	0	199,779	0.00
	49	Unallocated Sector	0	1,899,505	0.00

*Less than 0.01 per cent.

reveals, the total effect on this sector is 1.2 dollars.

The table on page 8 presents the results obtained from the structural matrix and shows each industry ranked by its degree of interdependency with the remaining sectors of the economy. Thus, it indicates the composite effect of a change in final demand for the product of each sector on the total output level of the economy. An increase of one million dollars in the demand for the output of the cotton clothing industry (No. 14) will require an increase of 1.4 million dollars in the industry's output level and will generate an additional demand of approximately 1.2 million dollars for products of other industries. Hence, the total requirements for satisfying a unit increase in demand for the product of this sector are 2.6 units in terms of total output of the economy. A comparison with the pulp and paper sector, for example, shows that the cotton clothing industry has a higher degree of interdependency in the sense that the effects generated in the economy by a change in the level of demand for the products of this sector are larger than the effects induced by a comparable change in the pulp and paper industry.

These production impact multipliers can be supplemented by an analysis of derived labour requirements on the basis of labour-output ratios. Thus, the direct and indirect effects on the level of employment can be estimated for any change in the level of gross provincial product or its components. In addition, the input-output technique can be

used for analyzing the impact of price changes on the economy.

Construction of the Transaction Flow Matrix

While the conceptual framework and the basic design of the input-output model involves the application of purely mathematical techniques, the construction of the component matrices requires the compilation and processing of a massive volume of data from a multiplicity of statistical sources.

In compiling an interindustry flow table, there are two major methodological approaches: the first involves tracing the flows of different commodities to ultimate users both by intermediate and final consumers resulting in completion of the matrix by rows. The second method—the cost approach—involves recording the inputs used by the different sectors and allows construction of the table by columns. The choice between these two methods depends mainly on the type of available data and their level of detail. The principal source of data, particularly for the manufacturing sectors which constitute the major part of the table, is the Annual Census of Manufactures. These data compiled by the Dominion Bureau of Statistics provide information on the inputs of raw materials and supplies used by establishments operating in the same industry. Consequently, the second approach was adopted for constructing the Ontario input-output table.

The Ontario table divides the provincial economy into 49 productive sectors: 42 manufacturing sectors, mining, construction,

trade and transportation including storage, two service sectors, agriculture and related activities and one unallocated sector.¹ This sectoral classification was chosen on the basis of the Standard Industrial Classification and the availability of data, especially on non-manufacturing sectors. However, the worksheets upon which the final tables are based were originally developed for 250 sectors.

The work of assembling the table was divided into three major stages:

1. Definition and measurement of the output of each sector in the provincial economy. For some sectors sufficient data exist to permit direct estimation of gross output. For other sectors however, output data were not available and indirect estimating procedures were applied.
2. Estimation and allocation of inputs by sector. Inputs consist of intermediate inputs of raw materials and services used in the production process and primary inputs such as labour costs and capital costs, etc. Since the information available on primary inputs pertains to wages and salaries only, the other items were derived by using a residualing technique. When information on the distribution of inputs for any sector was unavailable, the national input coefficients for 1961 were assumed to apply to Ontario.
3. Estimation of final demand for the products of each sector by type of final user. While the intermediate part of the table shows the output produced and consumed within the productive system, the final demand sector shows the output of each industry delivered outside the system to final users in both Ontario and the rest of the world. The final demand sector is divided into five major categories:
 - a) Personal consumer expenditure on goods and services.
 - b) Gross provincial capital formation.
 - c) Changes in inventories of:
 - (i) Finished goods and goods in process.
 - (ii) Raw materials and supplies.
 - d) Government expenditures:
 - (i) Ontario provincial government expenditure on goods and services (Current Account).

¹This version represents a condensation of a larger matrix consisting of 130 sectors. Under the Ontario Statistics Act, the table can be published only in aggregated form in order to comply with confidentiality requirements.

Ranking of Industries on the Basis of Effects Generated by a One-Dollar Increase**in Final Demand**

(Dollar Value)

Rank	I-O No.	Industry	Total Requirements	Effects on the Same Industry	Effects on All Other Industries
1	40	Plastics and Synthetic Resins	3.40155	1.11515	2.28640
2	3	Meat and Poultry	3.07334	1.29463	1.77871
3	8	Other Food Industries	2.95230	1.22050	1.73180
4	4	Dairy Products	2.94193	1.24305	1.69888
5	5	Grain Mills	2.90289	1.11580	1.78709
6	39	Petroleum Refineries and Coal Products	2.78940	1.10870	1.68070
7	41	Paint and Varnish	2.75407	1.06584	1.68823
8	13	Leather and Leather Products	2.72645	1.24334	1.48311
9	11	Tobacco and Tobacco Products	2.69206	1.16928	1.52278
10	44	Miscellaneous Manufacturing Industries	2.64495	1.11662	1.52833
11	36	Other Electrical Equipment	2.63150	1.02309	1.60841
12	23	Paper Products	2.61479	1.27793	1.33686
13	14	Cotton Yarn and Cloth	2.61078	1.44420	1.16658
14	16	Knitting Mills	2.60634	1.03690	1.56944
15	6	Biscuits and Bakeries	2.60106	1.00103	1.60003
16	43	Other Chemical Industries	2.59661	1.25476	1.34185
17	31	Motor Vehicles and Aircraft	2.58164	1.41744	1.16420
18	12	Rubber Products	2.57166	1.16684	1.40482
19	7	Sugar and Confectioneries	2.56302	1.35081	1.21221
20	42	Pharmaceuticals and Medicines	2.55686	1.03327	1.52359
21	15	Synthetic Textiles	2.54385	1.15116	1.39269
22	26	Other Primary Metals Industries	2.54014	1.51885	1.02129
23	33	Electrical Appliances	2.51910	1.00941	1.50969
24	18	Other Textile Mills	2.51322	1.26007	1.25315
25	32	Other Transportation Equipment	2.49556	1.20000	1.29556
26	35	Communication Equipment	2.45181	1.15447	1.29734
27	29	Other Metal Fabricating Industries	2.42997	1.12202	1.30795
28	28	Metal Stamping, Pressing and Coating	2.42638	1.00383	1.42255
29	17	Clothing Industries	2.38605	1.04237	1.34368
30	20	Furniture and Fixtures	2.35764	1.03304	1.32460
31	9	Soft Drinks	2.35378	1.00073	1.35305
32	38	Other Non-metallic Mineral Products	2.33476	1.23213	1.10263
33	21	Other Wood Industries	2.32387	1.13363	1.19024
34	34	Electrical Industrial Equipment	2.31389	1.00320	1.31069
35	37	Clay, Lime and Cement	2.22729	1.15233	1.07496
36	19	Sawmills	2.19199	1.43056	0.76143
37	45	Construction, Maintenance and Repair	2.17404	1.01718	1.15686
38	30	Miscellaneous Machinery	2.17071	1.01406	1.15665
39	22	Pulp and Paper Mills	2.13790	1.35914	0.77876
40	1	Agriculture, Forestry and Fishing	2.11372	1.12849	0.98523
41	25	Iron and Steel Mills	2.10318	1.24239	0.86079
42	27	Fabricated and Structural Metals	2.09266	1.00122	1.09144
43	24	Printing and Publishing	2.02703	1.07443	0.95260
44	10	Distilleries, Breweries and Wineries	2.00830	1.03687	0.97143
45	2	Mining	1.97200	1.08057	0.89143
46	46	Transportation, Storage and Trade	1.68667	1.12274	0.56393
47	47	Utilities	1.62275	1.22646	0.39629
48	48	Communications and Other Services	1.58276	1.13676	0.44600

(ii) Municipal government and school boards.

e) Trade balance and federal government expenditure which was derived as a residual item.

III DEFINITIONS OF OUTPUT AND ALLOCATION OF INPUTS BY SECTOR**Agriculture**

Total value of agricultural output is defined as including cash receipts from the sale of farm products, value of income in kind — the imputed value of agricultural commodities produced and consumed on the farm — and the value of changes in crop and live-stock inventories.

The intermediate inputs into agriculture and their distribution by industries were obtained from farm operating expenses compiled by the Dominion Bureau of Statistics and the Ontario Department of Agriculture and Food. On the whole, these sources provide adequate data on farm operating expenses in the province consistent with the Ontario input-output classification. In some cases however, operating expenses were further broken down by applying either technical coefficients derived from the 1961 input-output table for Canada or utilizing information collected from other sources.

To arrive at primary inputs into agriculture, wages and salaries were calculated by adding wages of farm labour and imputed wages of farm operators. Imputed wages were estimated by multiplying the number of farm operators by the average annual wage paid to farm labourers.

Other value added items were calculated as the difference between total input or output and total intermediate input plus wages and salaries.

Forestry and Fisheries

A control total for the value of output of the forestry and fisheries sector was estimated on the basis of information available from DBS publications, Fisheries Statistics, No. 24-209 and Logging, No. 25-201. The output of this sector is defined to include all forest products, the output of business establishments in services incidental to forestry, and output of fishing establishments operating in Ontario.

Detailed information on the distribution of inputs into this sector is virtually non-existent. Consequently the input distribution

of the national table was used incorporating adjustments and modifications consistent with the structure of the Ontario sector.

Mining

Information on mining was derived from the 1965 Annual Census of Mining. The census provides only control totals for value of shipments, raw materials and wages and salaries for twenty mining activities. These were aggregated into eight major sectors and the input distribution estimated on the basis of the national input-output table subject to modification by other collected information.

Manufacturing

The principal data source on manufacturing was the 1965 Annual Census of Manufactures for the province of Ontario compiled by DBS on the basis of the Standard Industrial Classification. The summary schedules available provide information on raw materials, supplies, purchased components, semi-processed goods, and fuel and electricity used in the production process during the year. In addition, each schedule contains data on value of shipments, changes in inventories of raw materials, finished goods and goods in process and the value of wages and salaries. However, such detailed information is not equally available for all industries due to the reporting system on which the census is based. For example, small establishments are required to report only totals for raw materials purchased and goods shipped.

Supplementing the Census of Manufactures, data from several special DBS surveys were utilized. This information was necessary to ascertain the distribution of the total value of containers and packaging supplies used by each industry and to estimate the value of service inputs into manufacturing sectors.

The first step in constructing the inter-industry flow table for the manufacturing sector required determination of control totals for the value of output produced by each industry. As pointed out earlier, the 1965 Census of Manufactures provides only the value of shipments. It was therefore necessary to adjust these figures for changes in inventories of finished goods in process while further adjustments were required to exclude the value of products purchased and resold without further processing.

Since census information is compiled on an establishment basis additional problems were encountered classifying commodities on the basis of the Standard Industrial Classification. As mentioned above, establishments

within an industry may produce in addition to their principal products, secondary goods which are primary to other industries. The difference between the industrial output classification used in the census and the input-output concept necessitates the identification and reclassification of industrial output and subsequent reallocation to the appropriate

industry. Therefore, a secondary products matrix showing the value of output of each industry and the designation to various producing sectors was constructed. The method followed for adjusting sectoral outputs for secondary products has been discussed in Section II of this article. The following table shows the adjusted value of industrial output

Ranking of Ontario Manufacturing Industries by Level of Total Output Produced in Ontario, 1965

(Valued at Producers' Prices in \$000)

Rank	I-O No.	Industry	Total Output	Percentage Distribution
1	31	Motor Vehicles and Aircraft	3,486,792	17.9
2	29	Other Metal Fabricating Industries	1,641,560	8.4
3	25	Iron and Steel Mills	1,051,243	5.4
4	43	Other Chemical Industries	992,485	5.1
5	8	Other Food Industries	796,498	4.1
6	26	Other Primary Metals Industries	745,129	3.8
7	3	Meat and Poultry	641,117	3.3
8	22	Pulp and Paper Mills	586,059	3.0
9	24	Printing and Publishing	584,097	3.0
10	39	Petroleum Refineries and Coal Products	567,456	2.9
11	35	Communication Equipments	546,021	2.8
12	44	Miscellaneous Manufacturing Industries	541,845	2.8
13	30	Miscellaneous Machinery	488,866	2.5
14	4	Dairy Products	474,177	2.4
15	23	Paper Products	437,824	2.3
16	28	Metal Stamping, Pressing and Coating	416,656	2.2
17	12	Rubber Products	387,082	2.0
18	34	Electrical Industrial Equipments	364,983	1.9
19	18	Other Textile Mills	353,138	1.8
20	33	Electrical Appliances	319,529	1.7
21	37	Clay, Lime and Cement	309,985	1.6
22	5	Grain Mills	295,328	1.5
23	10	Distilleries, Breweries and Wineries	288,876	1.5
24	20	Furniture and Fixtures	262,863	1.4
25	17	Clothing Industries	262,133	1.3
26	6	Biscuits and Bakeries	231,685	1.2
27	38	Other Non-metallic Mineral Products	221,148	1.1
28	15	Synthetic Textiles	203,897	1.0
29	27	Fabricated and Structural Metals	199,779	1.0
30	36	Other Electrical Equipment	189,909	1.0
31	13	Leather and Leather Products	178,063	0.9
32	40	Plastics and Synthetic Resins	175,331	0.9
33	11	Tobacco and Tobacco Products	172,462	0.9
34	21	Other Wood Industries	172,441	0.9
35	32	Other Transportation Equipment	163,802	0.8
36	7	Sugar and Confectioneries	144,404	0.7
37	42	Pharmaceuticals and Medicines	127,220	0.7
38	16	Knitting Mills	121,548	0.6
39	41	Paint and Varnish	120,334	0.6
40	19	Sawmills	84,206	0.4
41	9	Soft Drinks	81,209	0.4
42	14	Cotton Yarn and Cloth	58,742	0.3
Total			19,487,922	100.0

by sector and the relative share in total manufacturing output for the province of Ontario.

The second step in the analysis of the manufacturing sector involved the construction of a matrix showing the flows of input items purchased and used by each industry in the production process. For most industries, a detailed breakdown of raw materials and fuel and electricity consumed is available from the 1965 Census of Manufactures. Each of these input items was allocated to the industry which produced them as a primary product. It was assumed that other raw materials which could not be allocated to specific producing industries were distributed in the same manner as those inputs specified in the census questionnaires.

As the census schedules do not provide much detail concerning containers and other shipping materials used, the allocation of these items to industry-of-origin was based on a special DBS survey.

Construction

The construction sector for the interindustry table includes all construction work performed in Ontario during 1965 and carried out either by the construction industry proper or by the labour force of other industries. New construction consists of all new work put in place, including additions, major renovations, conversions and alterations where either structural change takes place or the life of an existing asset is extended. On the basis of this definition a control total for new construction was obtained from the DBS publications, *Private and Public Investment in Canada, 1965* and *Construction in Canada*.

Detailed input estimates for this sector were difficult to obtain. It was assumed that the technical coefficients developed by the Quebec Bureau of Statistics on a sample survey basis for the year 1961 can be applied with modifications based on information collected from the Ontario construction industry.

In order to make this assumption more flexible total new construction in Ontario for 1965 was broken down into approximately thirty types based on the homogeneity of the input patterns applying to each type. As the Quebec construction matrix is valued at 1961 prices, it was necessary to adjust all figures to 1965 prices — the base year of Ontario's table. Multiplying each control total of the thirty types of construction by the corresponding normalized Quebec matrix, a construction matrix for Ontario, in terms of 1965

prices, was derived. By adding all elements across each row, the final column of the input distribution was subsequently obtained.

Due to lack of information repair construction work and its input distribution were estimated by using preliminary data developed by the DBS Input-Output Section on the basis of value judgments and partial information obtained from a limited sample survey.

Services

The service industries encompass financial intermediaries, repair, amusement, recreational, health, education, personal business and welfare services. The data sources which provide information for the analysis of this sector on a provincial basis are unfortunately very limited. Although data on total receipts and wages by kind of business for particular service industries were available from the 1961 Census of Canada, remaining statistical gaps had to be filled by relying on indirect estimating procedures and on interindustry studies at national level for the year 1961. For some financial intermediaries it was impossible to obtain provincial figures which would enable determination of the total output for this industry. This difficulty arises from the fact that many of these establishments are involved in activities that extend beyond the boundary of any specific province.

As mentioned earlier, the 1961 Census of Canada provides basic information for estimating control totals of output and operating expenses for all service industries except financial intermediaries, health, education and welfare. Consequently, the census data had to be first adjusted to 1965 prices and then projected forward to the base year of the Ontario input-output model.

For personal, business (except financial intermediaries), amusement and recreational services the output levels were measured in terms of gross receipts. The ratios of 1961 to 1965 wages provided by DBS were applied to the census receipts of each subsection to obtain an estimate of the 1965 level of receipts. The implicit assumption underlying this method is that changes in wages between 1961 and 1965 are reflective of changes in receipt levels. As these service industries were analyzed primarily on an activity basis, it was necessary to make certain adjustments to the total value of receipts provided by the census such as the inclusion of all receipts arising from service activities conducted in retail and wholesale trade establishments and the exclu-

sion of all receipts arising from commodity sales in the service area.

The control totals for the value of outputs of other services such as education, health and welfare, and financial intermediaries were estimated by relating them to gross provincial product for 1965. From the national input-output table for 1961 the ratios of total output of each service sector to total value of gross national product were calculated. These ratios were assumed to apply to Ontario.

The final step in the analysis of the service industries was the estimation of total intermediate inputs and their sectoral allocation within the Ontario input-output classification. Due to lack of information on the cost structure of each service sector the national input coefficients were applied to the provincial control totals.

Trade Sector

As mentioned previously, output of the trade sector is defined as the trade margin. Several attempts were made to estimate the value of provincial output for this sector. However, the estimates generated proved to be unsatisfactory. Consequently, results of the 1961 national input-output study were used on the assumption that the trade markup for each commodity is locationally invariant. These estimates can be considered as reasonable approximations of the provincial trade margins until more comprehensive data become available.

Transportation and Storage

The transportation and storage sector is defined as including all transportation and storage establishments.

The output of this sector represents the total revenue derived from transporting Ontario's output to users either within or outside the province of Ontario. As in the case of the trade sector adequate information for estimating the total value of output and distribution of inputs was not available. Hence, the national transportation markup derived from the 1961 input-output matrix for Canada, in conjunction with the appropriate trade margins were applied to the Ontario input-output table valued at purchasers' prices. This procedure served a dual purpose: it facilitated the revaluation of each table entry from purchasers' to producers' prices and simultaneously permitted estimation of the inputs of these two sectors into each industry of the provincial economy.

Final Demand Categories

Personal Consumption Expenditures

Following the concepts of national income and expenditure accounts, personal expenditures on goods and services are defined as personal outlays for durable goods, non-durable goods and services. In addition, free board and lodging and all other income in kind are included as if persons received income equal to the value of the goods and services and then purchased these items. Total consumer expenditures for Ontario were available from a special econometric study conducted by the Economic Analysis Branch. Since complete data on consumption patterns by commodities are not available for Canada or Ontario, the value of sales by retail trade establishments in Ontario were utilized as a basis for allocating the total expenditure by household on durable and non-durable goods. The basic information was derived from the 1961 Census of Canada.

Final demand for output of the service sector was estimated either by applying the appropriate percentage distribution derived from the national income accounts and/or by relating consumer expenditure to gross national product.

Gross Provincial Capital Formation

The aggregate value of capital formation in Ontario was obtained directly from the DBS publication, *Private and Public Investment in Canada, 1965*. This provided control totals on new construction as well as on new machinery and equipment. The distribution of investment by industry of origin was estimated on the basis of available data for structurally comparable industries in the United States and other sources.

Government Expenditure on Goods and Services

This category of the final demand sector consists of current expenditures of provincial, federal and municipal governments and school boards on goods and services. Control totals for each category were obtained from the system of provincial income and expenditure accounts, developed by the Economic Analysis Branch and scheduled for publication later this year.

The sectoral allocation of provincial government expenditure was based on information obtained from the DBS Input-Output Section.

Allocation of municipal government expenditure on goods and services was approximated by applying modified ratios secured from the Quebec Bureau of Statistics. These ratios were obtained from a special survey conducted by QBS for the purpose of constructing an input-output table for the province of Quebec.

Value of Physical Changes in Inventories

For the purpose of interindustry analysis the net change of inventories during the year 1965 was taken into account.

The Annual Census of Manufactures provides information on opening and closing inventories at book value for three major categories: raw materials and supplies, finished goods, and goods in process.

Finished goods and goods in process held by each sector were considered to belong to the primary output. For changes in inventories of raw materials and supplies, the allocation was made on the basis of the input distribution for each sector.

CONCLUSION

Although subject to statistical limitations inherent in the current system of data collection, the present version of the Ontario input-output table reveals in detail the basic structure of the provincial economy in its major ramifications. The Ontario input-output model is of significant value in measuring, quantitatively, the impact of changes in final demand for the product of each sector upon the various levels of economic activity within the province. In addition, by use of supplementary data on employment required per unit of output, target outputs can be translated into sectoral employment requirements.

In order to enhance the usefulness of the model for the analysis of provincial and interprovincial trade-flows, an extensive study is currently being undertaken by the Economic Analysis Branch in cooperation with the Ontario Statistical Centre to estimate the value of provincial imports and exports by sector. The results of this study will be incorporated into the present table to develop an expanded version of the interindustry model, showing imports and exports as separate sectors. Ultimately, the provincial table will be supplemented by a series of consolidated regional input-output tables.

A comprehensive and detailed set of provincial economic accounts in conjunction with an econometric model for Ontario, currently under development in the Economic Analysis Branch and scheduled for publication later this year, will provide an integrated system of quantitative analytical techniques for long and short-term forecasting and the scientific evaluation of alternative economic policies.

Table I – The Inter-Industry Flow of Goods and Services, Ontario, 1965
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills
		1	2	3	4	5
1	Agriculture, Forestry and Fishing	113,606	0	318,845	211,375	100,308
2	Mining	2,217	44,924	709	747	1,916
3	Meat and Poultry	1,377	0	140,766	4,295	14,719
4	Dairy Products	0	0	2,364	91,401	1,377
5	Grain Mills	156,152	4	228	0	17,083
6	Biscuits and Bakeries	0	0	0	38	0
7	Sugar and Confectioneries	347	0	182	8,610	2,862
8	Other Food Industries	4,540	0	18,055	3,232	24,496
9	Soft Drinks	0	0	0	0	0
10	Distilleries, Breweries and Wineries	0	0	0	0	12
11	Tobacco and Tobacco Products	0	0	0	0	0
12	Rubber Products	3,257	0	0	0	0
13	Leather and Leather Products	0	0	0	0	0
14	Cotton Yarn and Cloth	357	0	0	0	0
15	Synthetic Textiles	0	0	0	0	0
16	Knitting Mills	0	0	0	0	0
17	Clothing Industries	232	0	0	0	0
18	Other Textile Mills	9,903	868	289	11	4,740
19	Sawmills	405	10	0	0	0
20	Furniture and Fixtures	0	0	0	0	0
21	Other Wood Industries	3,043	82	1,090	495	0
22	Pulp and Paper Mills	0	0	766	819	915
23	Paper Products	1,477	737	6,236	9,356	7,107
24	Printing and Publishing	0	4	603	1,016	727
25	Iron and Steel Mills	0	1,556	0	0	842
26	Other Primary Metals	0	12,054	9	0	0
27	Fabricated and Structural Metals	0	0	0	0	0
28	Metal Stamping, Pressing and Coating	46	1,299	2,669	2,016	341
29	Other Metal Fabricating Industries	5,276	23,113	0	0	0
30	Miscellaneous Machinery	20,955	652	0	0	0
31	Motor Vehicles and Aircraft	551	0	0	0	0
32	Other Transportation Equipment	308	1,104	0	0	0
33	Electrical Appliances	0	0	0	0	0
34	Electrical Industrial Equipment	0	0	0	0	0
35	Communication Equipment	135	0	0	0	0
36	Other Electrical Products	0	0	0	0	0
37	Clay, Lime and Cement	117	3,116	0	0	0
38	Other Non-metallic Mineral Products	26	0	54	919	0
39	Petroleum Refineries and Coal Products	84,943	10,187	1,098	2,685	887
40	Plastics and Synthetic Resins	12	14	3,735	404	56
41	Paint and Varnish	0	0	0	0	0
42	Pharmaceuticals and Medicines	0	0	0	0	4,531
43	Other Chemical Industries	48,338	38,430	567	397	33
44	Miscellaneous Manufacturing Industries	273	72	68	37	0
45	Construction, Maintenance and Repair	41,015	18,011	1,373	1,477	711
46	Transportation, Storage and Trade	121,991	34,868	25,110	10,213	33,197
47	Utilities	13,763	28,862	2,386	2,767	2,084
48	Communications and Other Services	88,668	45,333	6,021	9,762	4,618
49	Unallocated Sector	85,811	88,833	18,342	24,110	16,275
50	Total Intermediate Input (Rows 1 + ... + 49)	809,141	354,133	551,565	386,182	239,837
51	Wages and Salaries	166,596	171,437	65,036	65,316	28,061
52	Other Value Added	731,013	304,810	24,516	22,679	27,430
53	Total Value Added (Rows 51 + 52)	897,609	476,247	89,552	87,995	55,491
54	Total Input (Rows 50 + 53)	1,706,750	830,380	641,117	474,177	295,328

Biscuits and Bakeries	Sugar and Confection- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Industry No.
6	7	8	9	10	11	12	13	14	15	
886	3,229	142,634	0	4,013	69,994	0	0	0	15	1
477	2,652	1,522	854	667	43	961	476	136	371	2
3,904	0	41,380	0	0	0	0	26,693	0	0	3
3,136	4,751	8,253	0	0	0	0	0	0	0	4
33,246	89	40,728	0	9,583	0	0	20	0	0	5
0	64	56	0	0	0	0	0	0	0	6
7,988	37,207	11,527	5,565	1,440	6	0	106	0	0	7
30,934	6,954	131,880	7,465	13,287	0	0	256	222	0	8
0	0	0	0	0	0	0	0	0	0	9
0	0	355	191	9,788	0	0	0	0	0	10
0	0	0	0	0	24,968	0	0	0	0	11
0	0	0	0	0	0	53,289	1,878	0	0	12
0	0	0	0	0	0	1,019	34,731	0	0	13
0	0	1	0	0	0	4,612	2,009	17,230	8,802	14
0	0	0	0	0	0	38,334	0	8,549	21,648	15
0	0	0	0	0	0	0	0	0	0	16
0	0	0	0	0	0	0	0	84	0	17
3	115	827	0	0	2	393	3,296	3,688	13,217	18
0	0	1	0	0	0	0	0	0	0	19
0	0	0	0	0	0	0	0	0	0	20
0	0	52	108	292	766	116	220	0	2	21
863	1,896	3,309	0	1,088	776	1,057	878	85	6,762	22
7,866	5,960	19,404	5,007	10,502	5,910	2,077	1,939	286	1,125	23
4,493	2,073	5,193	731	2,267	769	306	132	44	56	24
0	0	0	0	0	0	0	0	0	0	25
0	0	0	0	0	2,063	0	0	0	0	26
0	0	0	0	0	0	0	0	0	0	27
54	456	45,485	3,540	3,240	7	300	0	0	69	28
0	0	0	0	0	0	4,429	2,663	0	0	29
0	0	0	0	0	0	0	0	0	0	30
0	0	0	0	0	0	0	0	0	0	31
0	0	0	0	0	0	70	0	0	0	32
0	0	0	0	0	0	0	0	0	0	33
0	0	0	0	0	0	0	0	0	0	34
0	0	0	0	0	0	0	0	0	0	35
0	0	0	0	233	0	0	0	0	0	36
0	10	0	0	0	0	998	82	0	0	37
0	100	9,959	534	8,438	0	208	0	0	1,043	38
1,557	298	1,858	669	671	134	1,162	549	99	1,250	39
5,555	37	1,753	0	0	885	42,019	1,821	29	538	40
0	0	0	0	0	0	2,112	0	0	0	41
0	0	214	0	0	0	0	0	0	0	42
64	77	27,176	61	1,629	60	22,130	3,257	1,068	49,095	43
0	7	2,468	265	2,540	37	1,927	5,407	19	58	44
655	498	1,694	315	850	533	970	357	318	854	45
13,956	6,873	41,663	3,828	7,467	6,688	11,129	10,673	1,926	6,235	46
1,169	716	3,215	430	1,794	236	3,215	819	680	1,336	47
8,867	4,254	15,419	2,517	9,757	2,911	11,285	5,434	882	4,661	48
14,299	12,113	55,185	10,852	27,577	9,984	25,032	12,319	2,294	9,313	49
139,972	60,429	613,211	42,932	117,123	126,772	229,150	116,015	37,639	126,450	50
68,052	27,485	89,841	24,193	46,615	14,513	89,596	53,311	14,589	36,910	51
23,661	26,490	93,446	14,084	125,138	31,177	69,336	8,737	6,514	40,537	52
91,713	53,975	183,287	38,277	171,753	45,690	157,932	62,048	21,103	77,447	53
231,685	144,404	796,498	81,209	288,876	172,462	387,082	178,063	58,742	203,897	54

Table I – The Inter-Industry Flow of Goods and Services, Ontario, 1965 – Continued
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Knitting Mills 16	Clothing Industries 17	Other Textile Mills 18	Sawmills 19	Furniture and Fixtures 20
	<i>For the distribution of output of an industry, read the row for that industry.</i>					
	<i>For the composition of inputs to an industry read the column for that industry.</i>					
1	Agriculture, Forestry and Fishing	0	7,267	909	23	26
2	Mining	237	39	519	0	457
3	Meat and Poultry	0	0	0	0	0
4	Dairy Products	0	0	0	0	0
5	Grain Mills	0	0	0	0	0
6	Biscuits and Bakeries	0	0	0	0	0
7	Sugar and Confectioneries	0	0	0	0	0
8	Other Food Industries	0	265	26	0	0
9	Soft Drinks	0	0	0	0	0
10	Distilleries, Breweries and Wineries	0	0	0	0	0
11	Tobacco and Tobacco Products	0	0	0	0	0
12	Rubber Products	64	152	2,448	0	0
13	Leather and Leather Products	502	217	180	0	198
14	Cotton Yarn and Cloth	12,216	32,306	22,725	0	4,864
15	Synthetic Textiles	22,135	18,866	55,915	0	12,807
16	Knitting Mills	4,299	9,459	271	0	0
17	Clothing Industries	0	10,479	72	0	0
18	Other Textile Mills	20,595	29,391	65,449	0	6,577
19	Sawmills	0	0	95	24,367	10,921
20	Furniture and Fixtures	0	0	1,581	0	8,273
21	Other Wood Industries	0	0	1,260	4,250	13,216
22	Pulp and Paper Mills	174	175	1,056	0	649
23	Paper Products	979	1,611	2,032	0	3,876
24	Printing and Publishing	133	0	230	0	124
25	Iron and Steel Mills	0	0	99	0	16
26	Other Primary Metals	0	0	1,274	0	12
27	Fabricated and Structural Metals	0	44	0	0	15,610
28	Metal Stamping, Pressing and Coating	0	0	60	0	15
29	Other Metal Fabricating Industries	3	37	944	0	17,661
30	Miscellaneous Machinery	0	47	4	0	0
31	Motor Vehicles and Aircraft	0	0	0	0	0
32	Other Transportation Equipment	0	0	0	0	218
33	Electrical Appliances	0	0	0	0	0
34	Electrical Industrial Equipment	0	0	0	0	0
35	Communication Equipment	0	0	35	0	700
36	Other Electrical Products	0	0	5	0	806
37	Clay, Lime and Cement	0	0	12	0	0
38	Other Non-metallic Mineral Products	0	0	121	0	1,233
39	Petroleum Refineries and Coal Products	241	149	893	1,026	396
40	Plastics and Synthetic Resins	387	96	3,712	0	8,257
41	Paint and Varnish	0	0	334	0	2,385
42	Pharmaceuticals and Medicines	0	0	10	0	0
43	Other Chemical Industries	1,048	245	5,637	36	1,187
44	Miscellaneous Manufacturing Industries	300	7,354	3,070	0	609
45	Construction, Maintenance and Repair	272	214	1,286	632	758
46	Transportation, Storage and Trade	3,013	12,812	14,072	7,522	16,798
47	Utilities	582	580	1,840	845	1,373
48	Communications and Other Services	5,285	8,037	6,876	2,102	8,858
49	Unallocated Sector	6,166	9,669	19,186	5,138	12,749
50	Total Intermediate Input (Rows 1 + ... + 49)	78,631	149,511	214,238	45,941	151,629
51	Wages and Salaries	29,301	61,958	63,952	21,528	82,469
52	Other Value Added	13,616	50,664	74,948	16,737	28,765
53	Total Value Added (Rows 51 + 52)	42,917	112,622	138,900	38,265	111,234
54	Total Input (Rows 50 + 53)	121,548	262,133	353,138	84,206	262,863

Other Wood Industries	Pulp and Paper Mills	Paper Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscellaneous Machinery	Industry No.
21	22	23	24	25	26	27	28	29	30	
3,857	456	0	0	0	0	0	0	0	0	1
244	12,707	4,197	135	118,022	20,262	180	607	6,484	2,458	2
0	0	0	0	0	0	0	0	0	0	3
0	0	265	0	0	0	0	0	0	0	4
0	8	0	0	0	0	0	0	0	0	5
0	0	227	0	0	0	0	0	0	0	6
0	0	0	0	0	0	0	0	0	0	7
0	3,605	103	0	30	0	0	837	0	0	8
0	0	0	0	0	0	0	0	0	0	9
0	61	570	0	0	0	0	0	0	0	10
0	0	0	0	0	0	0	0	0	0	11
0	0	120	35	0	0	0	100	534	0	12
0	0	0	3	0	0	0	0	0	0	13
0	0	168	0	0	0	0	0	0	0	14
272	0	1,015	0	0	0	0	0	1,274	0	15
0	0	0	0	0	0	0	0	0	0	16
0	0	0	0	0	0	0	0	0	0	17
2	1,379	2,541	407	5	9	0	8	272	149	18
33,142	399	0	0	0	87	171	418	2,831	623	19
652	0	0	0	0	0	0	0	418	0	20
17,605	7,972	4,570	6	291	1,149	20	35	5,766	1,973	21
2,950	152,323	69,810	38,049	508	138	0	621	895	648	22
699	946	92,094	1,448	57	9,995	0	3,217	11,483	9,399	23
0	3,431	4,760	20,123	151	22	0	262	845	58	24
357	0	1,576	0	194,655	35,024	71,609	165,058	260,405	97,842	25
1,147	0	5,940	267	20,102	244,322	1,184	23,531	213,807	43,982	26
0	0	0	200	0	0	0	0	21,386	0	27
78	5	375	20	33	3,198	0	15	11,400	147	28
3,188	0	311	1,692	3,291	29,288	7,138	23,537	126,496	12,525	29
0	0	0	0	0	295	0	8	7,694	6,233	30
47	0	0	0	0	4,645	0	0	33,606	259	31
0	0	0	0	0	591	0	0	19,659	631	32
0	0	0	0	0	662	0	0	8,040	1,627	33
0	0	0	0	0	0	0	616	622	0	34
0	0	0	0	0	428	0	0	2,483	0	35
0	0	0	0	2,336	1,310	0	255	1,841	0	36
11	2,711	2,158	0	16,682	6,795	1	0	765	183	37
2,310	339	1,229	1	0	7	0	4	28	198	38
462	3,387	3,570	520	1,590	11,206	1	611	4,305	2,394	39
653	501	16,500	1,020	0	238	35	87	310	98	40
129	114	0	0	0	269	532	5,582	5,384	3,356	41
0	0	0	0	0	0	0	0	0	0	42
1,952	22,056	9,745	6,648	7,157	5,719	6	151	3,186	32	43
1,416	23	1,580	128	0	3	0	752	1,922	221	44
676	2,585	1,867	3,972	5,565	8,511	637	1,073	6,849	1,641	45
19,077	30,918	24,952	7,842	26,538	37,948	3,580	14,255	65,358	23,700	46
1,391	19,885	2,166	5,835	25,527	17,450	803	2,022	11,080	1,846	47
4,793	10,244	17,480	82,606	15,131	16,003	3,622	13,241	56,084	25,072	48
7,519	30,259	25,227	94,805	89,729	28,788	10,225	14,238	115,507	21,091	49
104,629	306,314	295,116	265,762	527,400	484,362	99,744	271,141	1,009,019	258,386	50
49,388	121,109	98,227	230,588	213,938	177,788	50,493	84,983	424,059	115,048	51
18,424	158,636	44,481	87,747	309,905	82,979	49,542	60,532	208,482	115,432	52
67,812	279,745	142,708	318,335	523,843	260,767	100,035	145,515	632,541	230,480	53
172,441	586,059	437,824	584,097	1,051,243	745,129	199,779	416,656	1,641,560	488,866	54

Table I – The Inter-Industry Flow of Goods and Services, Ontario, 1965 – Continued
(Producers' Prices in Thousands of Dollars)

Industry No.	Industry	Motor Vehicles and Aircraft	Other Transportation Equipment	Electrical Appliances	Electrical Industrial Equipment	Communication Equipment
	For the distribution of output of an industry, read the row for that industry.					
	For the composition of inputs to an industry read the column for that industry.					
	Industry	31	32	33	34	35
1	Agriculture, Forestry and Fishing	0	4	0	0	0
2	Mining	10,334	378	1,424	667	846
3	Meat and Poultry	0	0	0	0	0
4	Dairy Products	0	0	0	0	0
5	Grain Mills	0	0	0	0	0
6	Biscuits and Bakeries	0	0	0	0	0
7	Sugar and Confectioneries	0	0	0	0	0
8	Other Food Industries	0	0	0	0	0
9	Soft Drinks	0	0	0	0	0
10	Distilleries, Breweries and Wineries	0	0	0	0	0
11	Tobacco and Tobacco Products	0	0	0	0	0
12	Rubber Products	74,602	0	0	0	2,149
13	Leather and Leather Products	239	500	82	1,418	1,411
14	Cotton Yarn and Cloth	4,058	0	0	0	0
15	Synthetic Textiles	16,720	652	0	0	389
16	Knitting Mills	0	0	0	0	0
17	Clothing Industries	0	0	0	0	0
18	Other Textile Mills	40,575	83	10	6	96
19	Sawmills	4,586	1,461	0	0	0
20	Furniture and Fixtures	224	23	165	0	194
21	Other Wood Industries	1,513	387	875	501	913
22	Pulp and Paper Mills	1,509	0	285	139	1,223
23	Paper Products	10,124	17	12,390	901	7,656
24	Printing and Publishing	212	0	391	30	360
25	Iron and Steel Mills	228,840	23,985	69,280	43,967	20,952
26	Other Primary Metals	170,690	6,076	28,057	51,242	109,111
27	Fabricated and Structural Metals	1,807	9	0	0	0
28	Metal Stamping, Pressing and Coating	12,012	0	41	80	83
29	Other Metal Fabricating Industries	70,575	19,252	5,718	897	1,380
30	Miscellaneous Machinery	14,423	8	0	0	0
31	Motor Vehicles and Aircraft	1,011,110	2,639	83	245	564
32	Other Transportation Equipment	2,068	26,937	0	0	0
33	Electrical Appliances	20,840	0	2,746	293	0
34	Electrical Industrial Equipment	5,358	0	24,213	660	4,317
35	Communication Equipment	22,756	0	1,794	16,125	71,906
36	Other Electrical Products	13,501	265	710	28,470	1,995
37	Clay, Lime and Cement	377	26	3	0	196
38	Other Non-metallic Mineral Products	42,412	0	341	6,281	8,933
39	Petroleum Refineries and Coal Products	4,690	494	1,477	544	1,903
40	Plastics and Synthetic Resins	1,058	140	5,309	1,359	12,055
41	Paint and Varnish	25,295	694	5,398	1,031	2,621
42	Pharmaceuticals and Medicines	0	0	0	0	0
43	Other Chemical Industries	5,848	26	412	298	412
44	Miscellaneous Manufacturing Industries	18,347	2,897	6	0	206
45	Construction, Maintenance and Repair	16,513	913	849	843	1,406
46	Transportation, Storage and Trade	169,550	6,730	13,987	12,682	21,951
47	Utilities	12,084	1,719	2,117	1,758	2,216
48	Communications and Other Services	67,184	3,908	10,987	12,550	25,394
49	Unallocated Sector	161,835	5,197	20,297	19,369	25,627
50	Total Intermediate Input (Rows 1 + ... + 49)	2,263,869	105,420	209,447	202,356	328,465
51	Wages and Salaries	561,105	38,013	69,805	105,847	141,760
52	Other Value Added	661,818	20,369	40,277	56,780	75,796
53	Total Value Added (Rows 51 + 52)	1,222,923	58,382	110,082	162,627	217,556
54	Total Input (Rows 50 + 53)	3,486,792	163,802	319,529	364,983	546,021

Other Electrical Products	Clay, Lime and Cement	Other Non- metallic Mineral Products	Petroleum Refineries and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceu- ticals and Medicines	Other Chemical Industries	Miscel- laneous Manufac- turing Industries	Construc- tion, Maintenance and Repair	Industry No.
36	37	38	39	40	41	42	43	44	45	
0	85	0	0	0	37	241	2,158	928	11,318	1
612	25,429	2,312	327,337	50	729	626	23,025	1,099	29,482	2
0	0	0	0	0	0	0	14,065	72	0	3
0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	163	0	0	5
0	0	0	0	0	0	0	0	0	0	6
0	0	0	0	0	0	495	99	19	0	7
0	284	2	0	1,999	4,661	1,852	30,635	179	0	8
0	0	0	0	82	0	473	1,401	0	0	9
0	0	0	0	0	0	0	198	0	113	10
0	0	0	0	0	0	0	0	0	0	11
0	0	4,617	0	0	842	0	3,870	12,793	10,031	12
7	0	816	97	47	0	0	872	4,375	112	13
0	50	0	0	0	0	0	0	674	121	14
0	0	0	0	0	0	0	336	2,751	1,936	15
0	0	0	0	0	0	0	0	235	0	16
0	0	0	0	0	0	0	59	305	0	17
9	15	363	0	8	0	0	1,085	6,558	18,505	18
0	6	895	0	7	0	0	363	4,639	66,598	19
65	0	60	0	0	0	0	0	798	4,920	20
35	343	265	216	222	1	14	562	7,668	107,173	21
772	2,941	2,455	0	174	28	613	10,822	6,611	9,542	22
4,811	2,279	6,154	998	685	732	5,656	23,703	9,009	18,261	23
212	23	117	34	12	535	2,239	3,171	2,807	0	24
17,650	3,817	0	9,331	0	0	0	3,559	6,124	48,025	25
32,177	25	516	0	0	0	0	4,388	16,588	99,608	26
0	0	0	0	0	0	0	174	732	76,209	27
121	58	103	7,386	285	4,984	2,887	19,057	14,256	37,744	28
2,683	5,093	80	0	0	0	0	2,945	7,417	245,495	29
0	6	0	0	0	0	0	0	438	8,498	30
672	0	0	0	0	0	0	0	287	3,568	31
0	0	0	0	0	0	0	116	177	0	32
0	0	0	0	0	0	0	0	3,513	3,876	33
0	0	0	0	0	0	0	0	1,958	18,371	34
5,650	0	0	0	477	0	0	8,670	1,812	54,830	35
3,368	0	1,768	0	0	0	0	1,902	4,950	38,033	36
168	39,999	8,599	96	586	157	0	828	421	163,828	37
1,256	3,376	41,128	0	0	180	8,668	6,459	5,057	35,376	38
514	3,864	3,163	44,639	649	711	416	49,670	1,239	39,293	39
7,935	436	596	0	13,283	7,073	332	10,959	56,586	377	40
1,254	0	0	2,477	886	6,765	0	1,650	1,957	16,910	41
0	0	0	0	0	0	3,810	10,381	0	117	42
2,550	858	4,502	22,661	111,128	29,773	7,040	170,628	4,209	9,769	43
6,906	107	183	304	18,494	110	1,077	11,464	44,552	22,191	44
463	2,069	1,411	8,800	681	317	526	7,902	1,939	1,811	45
10,475	30,979	9,856	51,512	2,431	5,826	5,217	58,296	20,043	343,183	46
985	4,576	8,135	2,551	845	389	346	26,399	3,014	2,758	47
7,294	12,485	7,483	5,217	1,568	5,524	9,618	34,440	23,897	146,413	48
17,332	33,436	20,779	6,469	4,192	11,920	27,387	93,173	59,023	23,572	49
125,976	172,639	126,358	490,125	158,791	81,294	79,533	639,647	341,709	1,717,967	50
42,658	71,012	61,154	23,572	8,581	23,078	29,920	155,543	153,089	1,118,079	51
21,275	66,334	33,636	53,759	7,959	15,962	17,767	197,295	47,047	340,672	52
63,933	137,346	94,790	77,331	16,540	39,040	47,687	352,838	200,136	1,458,751	53
189,909	309,985	221,148	567,456	175,331	120,334	127,220	992,485	541,845	3,176,718	54

Table I — The Inter-Industry Flow of Goods and Services, Ontario, 1965 — Continued
(Producers' Prices in Thousands of Dollars)

Industry No.	For the distribution of output of an industry, read the row for that industry. For the composition of inputs to an industry read the column for that industry.	Transporta- tion, Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Total Intermediate Demand (Columns 1 + ... + 49)
	Industry	46	47	48	49	50
1	Agriculture, Forestry and Fishing	75,308	0	29,182	6,088	1,102,792
2	Mining	2,734	2,857	1,320	34	656,515
3	Meat and Poultry	1,363	0	64,017	11,372	324,023
4	Dairy Products	1,625	0	49,590	7,328	170,090
5	Grain Mills	2,059	0	5,027	715	265,105
6	Biscuits and Bakeries	0	0	29,968	4,254	34,607
7	Sugar and Confectioneries	98	0	5,028	835	82,414
8	Other Food Industries	294	0	39,393	6,912	332,398
9	Soft Drinks	0	0	11,337	3,988	17,281
10	Distilleries, Breweries and Wineries	3,037	0	0	19,010	33,335
11	Tobacco and Tobacco Products	0	0	0	0	24,968
12	Rubber Products	9,799	0	878	42,030	223,488
13	Leather and Leather Products	91	0	823	2,294	50,034
14	Cotton Yarn and Cloth	3,272	0	9,736	402	123,603
15	Synthetic Textiles	4,582	0	598	165	208,944
16	Knitting Mills	0	0	0	0	14,264
17	Clothing Industries	6,114	0	513	2,128	19,986
18	Other Textile Mills	7,186	0	6,390	6,932	251,957
19	Sawmills	2,425	788	349	394	155,981
20	Furniture and Fixtures	126	0	315	0	17,814
21	Other Wood Industries	830	0	5,919	55	191,871
22	Pulp and Paper Mills	6,726	0	4,786	5,193	341,029
23	Paper Products	23,312	0	5,251	23,302	378,066
24	Printing and Publishing	3,914	149	6,289	315,001	384,049
25	Iron and Steel Mills	1,930	0	74	1,067	1,307,640
26	Other Primary Metals	966	0	902	2,655	1,092,695
27	Fabricated and Structural Metals	107	0	0	0	116,278
28	Metal Stamping, Pressing and Coating	4,892	0	0	0	178,857
29	Other Metal Fabricating Industries	7,538	0	2,205	207,366	840,236
30	Miscellaneous Machinery	2,905	813	5,610	5,901	74,490
31	Motor Vehicles and Aircraft	13,409	0	0	52,864	1,124,549
32	Other Transportation Equipment	9,625	0	0	236	61,740
33	Electrical Appliances	0	0	0	1,133	42,730
34	Electrical Industrial Equipment	39	0	0	9,470	65,624
35	Communication Equipment	309	0	377	7,002	195,489
36	Other Electrical Products	1,208	0	11	26,200	129,167
37	Clay, Lime and Cement	193	0	888	188	250,194
38	Other Non-metallic Mineral Products	937	0	1,068	7,513	195,736
39	Petroleum Refineries and Coal Products	86,910	2,649	17,552	2,100	401,275
40	Plastics and Synthetic Resins	1,144	0	237	400	208,031
41	Paint and Varnish	76	0	6,921	27,898	122,030
42	Pharmaceuticals and Medicines	0	0	6,708	5,646	31,417
43	Other Chemical Industries	1,572	130	16,966	48,164	694,133
44	Miscellaneous Manufacturing Industries	5,169	0	11,480	56,564	230,613
45	Construction, Maintenance and Repair	76,749	25,831	398,060	0	653,252
46	Transportation, Storage and Trade	272,076	6,426	91,040	511,495	2,287,957
47	Utilities	30,484	88,461	18,895	0	364,429
48	Communications and Other Services	323,966	21,175	605,626	464,296	2,284,848
49	Unallocated Sector	312,504	13,626	348,082	0	2,106,455
50	Total Intermediate Input (Rows 1 + ... + 49)	1,309,603	162,905	1,809,411	1,896,590	20,464,479
51	Wages and Salaries	1,743,107	85,714	1,564,222	0	8,782,639
52	Other Value Added	1,095,607	236,081	3,469,677	2,915	9,330,484
53	Total Value Added (Rows 51 + 52)	2,838,714	321,795	5,033,899	2,915	18,113,123
54	Total Input (Rows 50 + 53)	4,148,317	484,700	6,843,310	1,899,505	38,577,602

Personal Con- sumption Expenditures	Investment	Changes in Inventories, Finished Goods and Goods in Process	Changes in Inventories, Raw Materials	Provincial Government Expenditures	Municipal Government Expenditures	Trade Balance and Other Final Demand	Total Final Demand (Columns 51 + ... + 58)	Total Output (Columns 50 + 58)	Industry No.
51	52	53	54	55	56	57	58	59	
186,697	0	2,392	1,620	3,258	3,385	406,606	603,958	1,706,750	1
0	0	9,580	5,649	6,031	15,124	137,481	173,865	830,380	2
408,851	0	— 1,156	287	2,192	385	—93,465	317,094	641,117	3
134,836	0	729	185	2,109	323	165,905	304,087	474,177	4
117,990	0	—107	391	304	27	—88,382	30,223	295,328	5
134,085	0	—28	1	1,001	296	61,723	197,078	231,685	6
103,217	0	796	461	330	119	—42,933	61,990	144,404	7
361,060	0	6,982	1,161	1,537	1,383	91,977	464,100	796,498	8
66,246	0	481	10	317	317	— 3,443	63,928	81,209	9
121,848	0	1,385	28	10	63	132,207	255,541	288,876	10
46,085	0	—365	—48	100	162	101,560	147,494	172,462	11
21,132	323	—388	487	626	1,656	139,758	163,594	387,082	12
89,692	0	— 1,038	660	93	263	38,359	128,029	178,063	13
22,076	0	159	1,396	143	44	—88,679	—64,861	58,742	14
53,636	0	1,794	1,730	1	48	—62,256	— 5,047	203,897	15
60,327	0	282	120	23	31	46,501	107,284	121,548	16
447,859	0	495	85	310	3,914	—210,516	242,147	262,133	17
75,056	2,511	1,150	1,961	1,009	832	18,662	101,181	353,138	18
1,467	106	356	1,435	0	12,821	—87,960	—71,775	84,206	19
135,997	34,106	672	300	809	33	73,132	245,049	262,863	20
3,222	148	1,721	1,177	1,202	1,742	—28,642	—19,430	172,441	21
36,453	0	—176	649	76	31	207,997	245,030	586,059	22
22,006	0	1,989	1,694	593	2,594	30,882	59,758	437,824	23
38,803	0	2,070	214	2,024	8,145	148,792	200,048	584,097	24
0	0	30,039	48,612	229	2,301	—337,578	—256,397	1,051,243	25
6,507	0	729	16,945	474	26,658	—398,879	—347,566	745,129	26
0	0	3,324	944	10,343	41,300	27,590	83,501	199,779	27
5,353	1,475	1,885	1,073	3,332	937	—223,744	237,799	416,656	28
87,220	291,074	28,797	5,277	12,476	44,067	332,413	801,324	1,641,560	29
13,614	106,617	5,455	792	495	0	287,403	414,376	488,866	30
1,055,224	209,354	23,121	10,344	1,346	5,409	1,057,445	2,362,243	3,486,792	31
44,498	42,877	1,123	884	0	416	12,264	102,062	163,802	32
81,212	3,181	2,741	0	38	40	189,587	276,799	319,529	33
7,244	51,572	975	—25	497	0	239,096	299,359	364,983	34
54,908	48,724	6,505	1,262	852	4,023	234,258	350,532	546,021	35
11,147	21,724	1,947	214	376	139	25,195	60,742	189,909	36
9,681	0	1,511	870	3,618	40,356	3,755	59,791	309,985	37
23,221	0	796	745	204	1,474	— 1,028	25,412	221,148	38
223,688	0	799	1,195	6,003	20,110	—85,614	166,181	567,456	39
1,561	0	179	1,210	1	47	—35,698	—32,700	175,331	40
12,036	0	802	626	798	1,157	—17,115	— 1,696	120,334	41
90,932	0	7	40	1,512	437	2,875	95,803	127,220	42
70,834	0	4,497	2,279	2,695	6,438	211,609	298,352	992,485	43
133,266	40,373	6,097	2,617	1,677	3,886	123,316	311,232	541,845	44
88,430	1,686,209	0	1,733	65,655	51,215	630,224	2,523,466	3,176,718	45
2,995,356	556,071	43,094	24,111	105,517	137,042	—2,000,831	1,860,360	4,148,317	46
316,880	0	—16	2,231	1,806	55,714	—256,344	120,271	484,700	47
4,497,444	71,635	0	10,821	43,493	326,099	—391,030	4,558,462	6,843,310	48
0	0	0	21,255	1,470	0	—229,675	—206,950	1,899,505	49
0	0	0	0	0	0	0	0	0	50
0	0	0	0	307,300	961,995	0	1,269,295	10,051,934	51
0	0	0	0	0	0	0	0	9,330,484	52
0	0	0	0	307,300	961,995	0	1,269,295	19,382,418	53
12,518,897	3,168,080	194,182	177,708	596,305	1,784,998	942,248	19,382,418	0	54

Table II – Direct Requirements Table, Ontario, 1965
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Bakeries
	Industry	1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	.066563	.0	.497327	.445772	.339649	.003824
2	Mining	.001299	.054101	.001106	.001575	.006488	.002059
3	Meat and Poultry	.000807	.0	.219564	.009058	.049840	.016850
4	Dairy Products	.0	.0	.003687	.192757	.004663	.013536
5	Grain Mills	.091491	.000005	.000356	.0	.057844	.143497
6	Biscuits and Bakeries	.0	.0	.0	.000080	.0	.0
7	Sugar and Confectioneries	.000203	.0	.000284	.018158	.009691	.034478
8	Other Food Industries	.002660	.0	.028162	.006816	.082945	.133517
9	Soft Drinks	.0	.0	.0	.0	.0	.0
10	Distilleries, Breweries and Wineries	.0	.0	.0	.0	.000041	.0
11	Tobacco and Tobacco Products	.0	.0	.0	.0	.0	.0
12	Rubber Products	.001908	.0	.0	.0	.0	.0
13	Leather and Leather Products	.0	.0	.0	.0	.0	.0
14	Cotton Yarn and Cloth	.000209	.0	.0	.0	.0	.0
15	Synthetic Textiles	.0	.0	.0	.0	.0	.0
16	Knitting Mills	.0	.0	.0	.0	.0	.0
17	Clothing Industries	.000136	.0	.0	.0	.0	.0
18	Other Textile Mills	.005802	.001045	.000451	.000023	.016050	.000013
19	Sawmills	.000237	.000012	.0	.0	.0	.0
20	Furniture and Fixtures	.0	.0	.0	.0	.0	.0
21	Other Wood Industries	.001783	.000099	.001700	.001044	.0	.0
22	Pulp and Paper Mills	.0	.0	.001195	.001727	.003098	.003725
23	Paper Products	.000865	.000888	.009727	.019731	.024065	.033951
24	Printing and Publishing	.0	.000005	.000941	.002143	.002462	.019393
25	Iron and Steel Mills	.0	.001874	.0	.0	.002851	.0
26	Other Primary Metals	.0	.014516	.000014	.0	.0	.0
27	Fabricated and Structural Metals	.0	.0	.0	.0	.0	.0
28	Metal Stamping, Pressing and Coating	.000027	.001564	.004163	.004252	.001155	.000233
29	Other Metal Fabricating Industries	.003091	.027834	.0	.0	.0	.0
30	Miscellaneous Machinery	.012278	.000785	.0	.0	.0	.0
31	Motor Vehicles and Aircraft	.000323	.0	.0	.0	.0	.0
32	Other Transportation Equipment	.000180	.001330	.0	.0	.0	.0
33	Electrical Appliances	.0	.0	.0	.0	.0	.0
34	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
35	Communication Equipment	.000079	.0	.0	.0	.0	.0
36	Other Electrical Products	.0	.0	.0	.0	.0	.0
37	Clay, Lime and Cement	.000069	.003752	.0	.0	.0	.0
38	Other Non-metallic Mineral Products	.000015	.0	.000084	.001938	.0	.0
39	Petroleum Refineries and Coal Products	.049769	.012268	.001713	.005662	.003003	.006720
40	Plastics and Synthetic Resins	.000007	.000017	.005826	.000852	.000190	.023977
41	Paint and Varnish	.0	.0	.0	.0	.0	.0
42	Pharmaceuticals and Medicines	.0	.0	.0	.0	.015342	.0
43	Other Chemical Industries	.028322	.046280	.000884	.000837	.000112	.000276
44	Miscellaneous Manufacturing Industries	.000160	.000087	.000106	.000078	.0	.0
45	Construction, Maintenance and Repair	.024031	.021690	.002142	.003115	.002407	.002827
46	Transportation, Storage and Trade	.071476	.041990	.039166	.021538	.112407	.060237
47	Utilities	.008064	.034758	.003722	.005835	.007057	.005046
48	Communications and Other Services	.051951	.054593	.009391	.020587	.015637	.038272
49	Unallocated Sector	.050277	.106979	.028609	.050846	.055108	.061717
50	Wages and Salaries	.097611	.206456	.101442	.137746	.095016	.293726
51	Other Value Added	.428307	.367073	.038240	.047829	.092880	.102126
52	Total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.

Table II — Direct Requirements Table, Ontario, 1965 — Continued
(Producers' Prices in Dollars)

Industry No.	Industry	For the composition of inputs to an industry, read the column for that industry.					
		Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper Mills
		17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	.027723	.002574	.000273	.000099	.022367	.000778
2	Mining	.000149	.001470	.0	.001739	.001415	.021682
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.0	.0
5	Grain Mills	.0	.0	.0	.0	.0	.000014
6	Biscuits and Bakeries	.0	.0	.0	.0	.0	.0
7	Sugar and Confectioneries	.0	.0	.0	.0	.0	.0
8	Other Food Industries	.001011	.000074	.0	.0	.0	.006151
9	Soft Drinks	.0	.0	.0	.0	.0	.0
10	Distilleries, Breweries and Wineries	.0	.0	.0	.0	.0	.000104
11	Tobacco and Tobacco Products	.0	.0	.0	.0	.0	.0
12	Rubber Products	.000580	.006932	.0	.0	.0	.0
13	Leather and Leather Products	.000828	.000510	.0	.000753	.0	.0
14	Cotton Yarn and Cloth	.123243	.064352	.0	.018504	.0	.0
15	Synthetic Textiles	.071971	.158338	.0	.048721	.001577	.0
16	Knitting Mills	.036085	.000767	.0	.0	.0	.0
17	Clothing Industries	.039976	.000204	.0	.0	.0	.0
18	Other Textile Mills	.112122	.185335	.0	.025021	.000012	.002353
19	Sawmills	.0	.000269	.289374	.041546	.192193	.000681
20	Furniture and Fixtures	.0	.004477	.0	.031473	.003781	.0
21	Other Wood Industries	.0	.003568	.050471	.050277	.102093	.013603
22	Pulp and Paper Mills	.000668	.002990	.0	.002469	.017107	.259911
23	Paper Products	.006146	.005754	.0	.014745	.004054	.001614
24	Printing and Publishing	.0	.000651	.0	.000472	.0	.005854
25	Iron and Steel Mills	.0	.000280	.0	.000061	.002070	.0
26	Other Primary Metals	.0	.003608	.0	.000046	.006652	.0
27	Fabricated and Structural Metals	.000168	.0	.0	.059385	.0	.0
28	Metal Stamping, Pressing and Coating	.0	.000170	.0	.000057	.000452	.000009
29	Other Metal Fabricating Industries	.000141	.002673	.0	.067187	.018487	.0
30	Miscellaneous Machinery	.000179	.000011	.0	.0	.0	.0
31	Motor Vehicles and Aircraft	.0	.0	.0	.0	.000273	.0
32	Other Transportation Equipment	.0	.0	.0	.000829	.0	.0
33	Electrical Appliances	.0	.0	.0	.0	.0	.0
34	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
35	Communication Equipment	.0	.000099	.0	.002663	.0	.0
36	Other Electrical Products	.0	.000014	.0	.003066	.0	.0
37	Clay, Lime and Cement	.0	.000034	.0	.0	.000064	.004626
38	Other Non-metallic Mineral Products	.0	.000343	.0	.004691	.013396	.000578
39	Petroleum Refineries and Coal Products	.000568	.002529	.012184	.001506	.002679	.005779
40	Plastics and Synthetic Resins	.000366	.010511	.0	.031412	.003787	.000855
41	Paint and Varnish	.0	.000946	.0	.009073	.000748	.000195
42	Pharmaceuticals and Medicines	.0	.000028	.0	.0	.0	.0
43	Other Chemical Industries	.000935	.015963	.000428	.004516	.011320	.037634
44	Miscellaneous Manufacturing Industries	.028054	.008693	.0	.002317	.008212	.000039
45	Construction, Maintenance and Repair	.000816	.003642	.007505	.002884	.003920	.004411
46	Transportation, Storage and Trade	.048876	.039848	.089329	.063904	.110629	.052756
47	Utilities	.002213	.005210	.010035	.005223	.008067	.033930
48	Communications and Other Services	.030660	.019471	.024963	.033698	.027795	.017479
49	Unallocated Sector	.036886	.054330	.061017	.048501	.043603	.051631
50	Wages and Salaries	.236361	.181097	.255659	.313734	.286405	.206650
51	Other Value Added	.193276	.212235	.198763	.109430	.106843	.270683
52	Total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.

Table II – Direct Requirements Table, Ontario, 1965 – Continued
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Electrical Appliances	Electrical Industrial Equipment	Communi- cation Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non- metallic Mineral Products
	Industry	33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	.0	.0	.0	.0	.000274	.0
2	Mining	.004457	.001827	.001549	.003223	.082033	.010455
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.0	.0
5	Grain Mills	.0	.0	.0	.0	.0	.0
6	Biscuits and Bakeries	.0	.0	.0	.0	.0	.0
7	Sugar and Confectioneries	.0	.0	.0	.0	.0	.0
8	Other Food Industries	.0	.0	.0	.0	.000916	.000009
9	Soft Drinks	.0	.0	.0	.0	.0	.0
10	Distilleries, Breweries and Wineries	.0	.0	.0	.0	.0	.0
11	Tobacco and Tobacco Products	.0	.0	.0	.0	.0	.0
12	Rubber Products	.0	.0	.003936	.0	.0	.020877
13	Leather and Leather Products	.000257	.003885	.002584	.000037	.0	.003690
14	Cotton Yarn and Cloth	.0	.0	.0	.0	.000161	.0
15	Synthetic Textiles	.0	.0	.000712	.0	.0	.0
16	Knitting Mills	.0	.0	.0	.0	.0	.0
17	Clothing Industries	.0	.0	.0	.0	.0	.0
18	Other Textile Mills	.000031	.000016	.000176	.000047	.000048	.001641
19	Sawmills	.0	.0	.0	.0	.000019	.004047
20	Furniture and Fixtures	.000516	.0	.000355	.000342	.0	.000271
21	Other Wood Industries	.002738	.001373	.001672	.000184	.001107	.001198
22	Pulp and Paper Mills	.000892	.000381	.002240	.004065	.009488	.011101
23	Paper Products	.038776	.002469	.014021	.025333	.007352	.027828
24	Printing and Publishing	.001224	.000082	.000659	.001116	.000074	.000529
25	Iron and Steel Mills	.216819	.120463	.038372	.092939	.012313	.0
26	Other Primary Metals	.087807	.140396	.199829	.169434	.000081	.002333
27	Fabricated and Structural Metals	.0	.0	.0	.0	.0	.0
28	Metal Stamping, Pressing and Coating	.000128	.000219	.000152	.000637	.000187	.000466
29	Other Metal Fabricating Industries	.017895	.002458	.002527	.014128	.016430	.000362
30	Miscellaneous Machinery	.0	.0	.0	.0	.000019	.0
31	Motor Vehicles and Aircraft	.000260	.000671	.001033	.003539	.0	.0
32	Other Transportation Equipment	.0	.0	.0	.0	.0	.0
33	Electrical Appliances	.008594	.000803	.0	.0	.0	.0
34	Electrical Industrial Equipment	.075777	.001808	.007906	.0	.0	.0
35	Communication Equipment	.005615	.044180	.131691	.029751	.0	.0
36	Other Electrical Products	.002222	.078004	.003654	.017735	.0	.007995
37	Clay, Lime and Cement	.000009	.0	.000359	.000885	.129035	.038883
38	Other Non-metallic Mineral Products	.001067	.017209	.016360	.006614	.010891	.185975
39	Petroleum Refineries and Coal Products	.004622	.001490	.003485	.002707	.012465	.014303
40	Plastics and Synthetic Resins	.016615	.003723	.022078	.041783	.001407	.002695
41	Paint and Varnish	.016894	.002825	.004800	.006603	.0	.0
42	Pharmaceuticals and Medicines	.0	.0	.0	.0	.0	.0
43	Other Chemical Industries	.001289	.000816	.000755	.013427	.002768	.020357
44	Miscellaneous Manufacturing Industries	.000019	.0	.000377	.036365	.000345	.000828
45	Construction, Maintenance and Repair	.002657	.002310	.002575	.002438	.006675	.006380
46	Transportation, Storage and Trade	.043774	.034747	.040202	.055158	.099937	.044567
47	Utilities	.006625	.004817	.004058	.005187	.014762	.036785
48	Communications and Other Services	.034385	.034385	.046507	.038408	.040276	.033837
49	Unallocated Sector	.063522	.053068	.046934	.091265	.107863	.093960
50	Wages and Salaries	.218463	.290006	.259624	.224623	.229083	.276530
51	Other Value Added	.126051	.155569	.138815	.112028	.213991	.152097
52	Total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Note: Figures may not add to total due to rounding.

Petroleum Refineries and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceuticals and Medicines	Other Chemical Industries	Miscellaneous Manufacturing Industries	Construction, Maintenance and Repair	Transportation, Storage and Trade	Utilities	Communications and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	49	
.0	.0	.000307	.001894	.002174	.001713	.003563	.018154	.0	.004264	.003205	1
.576850	.000285	.006058	.004921	.023199	.002028	.009281	.000659	.005894	.000193	.000018	2
.0	.0	.0	.0	.014171	.000133	.0	.000329	.0	.009355	.005987	3
.0	.0	.0	.0	.0	.0	.0	.000392	.0	.007246	.003858	4
.0	.0	.0	.0	.000164	.0	.0	.000496	.0	.000735	.000376	5
.0	.0	.0	.0	.0	.0	.0	.0	.0	.004379	.002240	6
.0	.0	.0	.003891	.000100	.000035	.0	.000024	.0	.000735	.000440	7
.0	.011401	.038734	.014557	.030867	.000330	.0	.000071	.0	.005756	.003639	8
.0	.000468	.0	.003718	.001412	.0	.0	.0	.0	.001657	.002099	9
.0	.0	.0	.0	.000199	.0	.000036	.000732	.0	.0	.010008	10
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	11
.0	.0	.006997	.0	.003899	.023610	.003158	.002362	.0	.000128	.022127	12
.000171	.000268	.0	.0	.000879	.008074	.000035	.000022	.0	.000120	.001208	13
.0	.0	.0	.0	.0	.001244	.000038	.000789	.0	.001423	.000212	14
.0	.0	.0	.0	.000339	.005077	.000609	.001105	.0	.000087	.000087	15
.0	.0	.0	.0	.0	.000434	.0	.0	.0	.0	.0	16
.0	.0	.0	.0	.000059	.000563	.0	.001474	.0	.000075	.001120	17
.0	.000046	.0	.0	.001093	.012103	.005825	.001732	.0	.000934	.003649	18
.0	.000040	.0	.0	.000366	.008561	.020964	.000585	.001626	.000051	.000207	19
.0	.0	.0	.0	.0	.001473	.001549	.000030	.0	.000046	.0	20
.000381	.001266	.000008	.000110	.000566	.014152	.033737	.000200	.0	.000865	.000029	21
.0	.000992	.000233	.004818	.010904	.012201	.003004	.001621	.0	.000699	.002734	22
.001759	.003907	.006083	.044458	.023882	.016627	.005748	.005620	.0	.000767	.012267	23
.000060	.000068	.004446	.017599	.003195	.005180	.0	.000944	.000307	.000919	.165833	24
.016444	.0	.0	.0	.003586	.011302	.015118	.000465	.0	.000011	.000562	25
.0	.0	.0	.0	.004421	.030614	.031356	.000233	.0	.000132	.001398	26
.0	.0	.0	.0	.000175	.001351	.023990	.000026	.0	.0	.0	27
.013016	.001625	.041418	.022693	.019201	.026310	.011881	.001179	.0	.0	.0	28
.0	.0	.0	.0	.002967	.013688	.077279	.001817	.0	.000322	.109168	29
.0	.0	.0	.0	.0	.000808	.002675	.000700	.001677	.000820	.003107	30
.0	.0	.0	.0	.0	.000530	.001123	.003232	.0	.0	.027830	31
.0	.0	.0	.0	.000117	.000327	.0	.002320	.0	.0	.000124	32
.0	.0	.0	.0	.0	.006483	.001220	.0	.0	.0	.000596	33
.0	.0	.0	.0	.0	.003614	.005783	.000009	.0	.0	.004986	34
.0	.002721	.0	.0	.008736	.003344	.017260	.000074	.0	.000055	.003686	35
.0	.0	.0	.0	.001916	.009135	.011972	.000291	.0	.000002	.013793	36
.000169	.003342	.001305	.0	.000834	.000777	.051571	.000047	.0	.000130	.000099	37
.0	.0	.001496	.068134	.006508	.009333	.011136	.000226	.0	.000156	.003955	38
.078665	.003702	.005909	.003270	.050046	.002287	.012369	.020951	.005465	.002565	.001106	39
.0	.075760	.058778	.002610	.011042	.104432	.000119	.000276	.0	.000035	.000211	40
.004365	.005053	.056219	.0	.001662	.003612	.005323	.000018	.0	.001011	.014687	41
.0	.0	.0	.029948	.010460	.0	.000037	.0	.0	.000980	.002972	42
.039934	.633818	.247420	.055337	.171920	.007768	.003075	.000379	.000268	.002479	.025356	43
.000536	.105480	.000914	.008466	.011551	.082223	.006986	.001246	.0	.001678	.029778	44
.015508	.003884	.002634	.004135	.007962	.003579	.000570	.018501	.053293	.058168	.0	45
.090777	.013865	.048415	.041008	.058737	.036990	.108031	.065587	.013258	.013304	.269278	46
.004496	.004819	.003233	.002720	.026599	.005562	.000868	.007349	.182507	.002761	.0	47
.009194	.008943	.045906	.075601	.034701	.044103	.046089	.078096	.043687	.088499	.244430	48
.011400	.023909	.099058	.215273	.093878	.108930	.007420	.075333	.028112	.050865	.0	49
.041540	.048942	.191783	.235183	.156722	.282533	.351961	.420196	.176839	.228577	.0	50
.094737	.045394	.132647	.139656	.198789	.086828	.107241	.264109	.487067	.507017	.001535	51
1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	52

Table III – Total Requirements Table, Ontario, 1965
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Bakeries
	Industry	1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	1.12849	0.00941	0.73819	0.64061	0.48653	0.14969
2	Mining	0.05127	1.08057	0.04144	0.04171	0.04163	0.02795
3	Meat and Poultry	0.01317	0.00494	1.29463	0.02476	0.08392	0.04994
4	Dairy Products	0.00284	0.00222	0.00915	1.24305	0.01131	0.02477
5	Grain Mills	0.11105	0.00168	0.07578	0.06412	1.11580	0.17761
6	Biscuits and Bakeries	0.00082	0.00097	0.00088	0.00110	0.00101	1.00103
7	Sugar and Confectioneries	0.00253	0.00056	0.00338	0.03230	0.01784	0.05348
8	Other Food Industries	0.01934	0.00552	0.05813	0.02544	0.12101	0.18810
9	Soft Drinks	0.00054	0.00068	0.00058	0.00063	0.00071	0.00066
10	Distilleries, Breweries and Wineries	0.00131	0.00180	0.00159	0.00179	0.00205	0.00194
11	Tobacco and Tobacco Products	0.0	0.0	0.0	0.0	0.0	0.0
12	Rubber Products	0.00677	0.00562	0.00658	0.00685	0.00720	0.00594
13	Leather and Leather Products	0.00039	0.00050	0.00044	0.00047	0.00051	0.00052
14	Cotton Yarn and Cloth	0.00245	0.00114	0.00213	0.00197	0.00420	0.00175
15	Synthetic Textiles	0.00387	0.00194	0.00344	0.00318	0.00739	0.00298
16	Knitting Mills	0.00003	0.00002	0.00003	0.00003	0.00005	0.00003
17	Clothing Industries	0.00056	0.00040	0.00057	0.00054	0.00069	0.00051
18	Other Textile Mills	0.01264	0.00374	0.01013	0.00866	0.02923	0.00780
19	Sawmills	0.00347	0.00259	0.00369	0.00337	0.00295	0.00225
20	Furniture and Fixtures	0.00018	0.00013	0.00017	0.00016	0.00024	0.00013
21	Other Wood Industries	0.00496	0.00275	0.00669	0.00572	0.00421	0.00333
22	Pulp and Paper Mills	0.00778	0.00765	0.01403	0.01877	0.02280	0.02948
23	Paper Products	0.01277	0.01015	0.02888	0.04405	0.05006	0.06645
24	Printing and Publishing	0.02030	0.02864	0.02568	0.03111	0.03350	0.05084
25	Iron and Steel Mills	0.01702	0.02458	0.01910	0.01827	0.02261	0.01795
26	Other Primary Metals	0.01428	0.04243	0.01458	0.01495	0.01542	0.01366
27	Fabricated and Structural Metals	0.00139	0.00176	0.00126	0.00126	0.00121	0.00094
28	Metal Stamping, Pressing and Coating	0.00483	0.00551	0.01209	0.01007	0.01211	0.01458
29	Other Metal Fabricating Industries	0.02478	0.05906	0.02565	0.02754	0.02818	0.02474
30	Miscellaneous Machinery	0.01495	0.00223	0.01017	0.00903	0.00721	0.00288
31	Motor Vehicles and Aircraft	0.00655	0.00912	0.00736	0.00806	0.00878	0.00787
32	Other Transportation Equipment	0.00120	0.00300	0.00118	0.00112	0.00136	0.00100
33	Electrical Appliances	0.00039	0.00059	0.00040	0.00042	0.00043	0.00039
34	Electrical Industrial Equipment	0.00090	0.00117	0.00099	0.00109	0.00112	0.00104
35	Communication Equipment	0.00229	0.00266	0.00225	0.00223	0.00223	0.00212
36	Other Electrical Products	0.00252	0.00337	0.00279	0.00308	0.00322	0.00299
37	Clay, Lime and Cement	0.00371	0.00831	0.00350	0.00363	0.00359	0.00306
38	Other Non-metallic Mineral Products	0.00275	0.00282	0.00357	0.00596	0.00598	0.00572
39	Petroleum Refineries and Coal Products	0.07102	0.02467	0.05283	0.05189	0.04221	0.02697
40	Plastics and Synthetic Resins	0.00363	0.00370	0.01265	0.00626	0.00669	0.03299
41	Paint and Varnish	0.00300	0.00368	0.00334	0.00360	0.00373	0.00360
42	Pharmaceuticals and Medicines	0.00285	0.00147	0.00233	0.00212	0.01882	0.00406
43	Other Chemical Industries	0.05707	0.07486	0.05358	0.04528	0.04630	0.05415
44	Miscellaneous Manufacturing Industries	0.00636	0.00800	0.00832	0.00803	0.00905	0.01160
45	Construction, Maintenance and Repair	0.04271	0.03935	0.03639	0.03560	0.03265	0.02332
46	Transportation, Storage and Trade	0.16187	0.12212	0.18883	0.16148	0.25858	0.18350
47	Utilities	0.02120	0.05421	0.02335	0.02526	0.02615	0.02051
48	Communications and Other Services	0.12844	0.13839	0.12865	0.14244	0.13924	0.14019
49	Unallocated Sector	0.11052	0.16132	0.13199	0.15289	0.16122	0.15409
50	Total	2.11372	1.97200	3.07334	2.94193	2.90289	2.60106

Note: Figures may not add to total due to rounding.

Sugar and Confection- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	Industry No.
7	8	9	10	11	12	13	14	15	16	
0.09282	0.33579	0.04561	0.05588	0.54080	0.01447	0.14737	0.01155	0.01632	0.01173	1
0.04364	0.03733	0.03529	0.01720	0.03226	0.03048	0.02580	0.02131	0.03853	0.02110	2
0.01119	0.09309	0.01310	0.01074	0.00843	0.00943	0.24559	0.00564	0.01073	0.00687	3
0.05856	0.02001	0.00801	0.00341	0.00256	0.00224	0.00366	0.00176	0.00212	0.00209	4
0.01510	0.09947	0.01175	0.04588	0.05361	0.00269	0.01604	0.00223	0.00300	0.00204	5
0.00167	0.00115	0.00118	0.00088	0.00092	0.00091	0.00098	0.00070	0.00083	0.00089	6
1.35081	0.02613	0.09549	0.00927	0.00154	0.00081	0.00217	0.00064	0.00086	0.00061	7
0.08470	1.22050	0.12190	0.06616	0.01154	0.01483	0.01832	0.01369	0.01741	0.00850	8
0.00066	0.00075	1.00073	0.00056	0.00060	0.00097	0.00069	0.00060	0.00102	0.00069	9
0.00217	0.00267	0.00493	1.03687	0.00176	0.00181	0.00190	0.00141	0.00169	0.00156	10
0.0	0.0	0.0	0.0	1.16928	0.0	0.0	0.0	0.0	0.0	11
0.00627	0.00774	0.00730	0.00634	0.00643	1.16684	0.02275	0.00579	0.00750	0.00799	12
0.00049	0.00070	0.00063	0.00069	0.00045	0.00480	1.24334	0.00058	0.00095	0.00606	13
0.00148	0.00204	0.00139	0.00117	0.00182	0.03042	0.02515	1.44420	0.08023	0.18927	14
0.00256	0.00353	0.00250	0.00215	0.00300	0.13807	0.01381	0.26027	1.15116	0.28881	15
0.00003	0.00004	0.00003	0.00003	0.00003	0.00005	0.00007	0.00021	0.00011	1.03690	16
0.00050	0.00059	0.00052	0.00038	0.00053	0.00047	0.00058	0.00253	0.00055	0.00071	17
0.00544	0.00920	0.00411	0.00397	0.00772	0.01770	0.03576	0.13434	0.10062	0.25560	18
0.00223	0.00295	0.00268	0.00233	0.00436	0.00251	0.00343	0.00199	0.00255	0.00223	19
0.00011	0.00016	0.00012	0.00012	0.00016	0.00020	0.00033	0.00070	0.00056	0.00127	20
0.00353	0.00407	0.00484	0.00381	0.01005	0.00338	0.00576	0.00267	0.00364	0.00334	21
0.04956	0.02738	0.03046	0.02485	0.02609	0.02462	0.02292	0.02488	0.06768	0.02757	22
0.08270	0.05518	0.09645	0.05953	0.06115	0.02470	0.03170	0.02078	0.02722	0.02508	23
0.05382	0.04149	0.04987	0.03696	0.03252	0.02981	0.03094	0.02334	0.02713	0.02626	24
0.01637	0.05051	0.03861	0.01783	0.01545	0.01897	0.01903	0.01041	0.01635	0.01112	25
0.01442	0.02290	0.02041	0.01309	0.03469	0.01822	0.01911	0.01095	0.01578	0.01246	26
0.00096	0.00119	0.00100	0.00076	0.00115	0.00112	0.00127	0.00087	0.00098	0.00089	27
0.01163	0.07433	0.05352	0.01767	0.00374	0.00956	0.00655	0.00473	0.01042	0.00462	28
0.02792	0.03356	0.03396	0.02347	0.02649	0.03952	0.04657	0.01947	0.02384	0.02174	29
0.00227	0.00537	0.00180	0.00160	0.00774	0.00125	0.00301	0.00096	0.00114	0.00103	30
0.00891	0.00935	0.01027	0.00743	0.00799	0.00811	0.00893	0.00604	0.00703	0.00668	31
0.00100	0.00124	0.00106	0.00074	0.00110	0.00132	0.00133	0.00072	0.00088	0.00075	32
0.00041	0.00050	0.00050	0.00041	0.00042	0.00060	0.00078	0.00031	0.00038	0.00036	33
0.00116	0.00131	0.00139	0.00102	0.00103	0.00114	0.00126	0.00083	0.00099	0.00092	34
0.00192	0.00270	0.00211	0.00170	0.00213	0.00452	0.00257	0.00254	0.00513	0.00263	35
0.00330	0.00380	0.00393	0.00402	0.00296	0.00359	0.00356	0.00255	0.00345	0.00279	36
0.00321	0.00474	0.00380	0.00396	0.00350	0.00680	0.00350	0.00239	0.00356	0.00238	37
0.00507	0.02208	0.01293	0.04043	0.00279	0.00624	0.00354	0.00454	0.01265	0.00485	38
0.01748	0.03495	0.02112	0.01321	0.04001	0.02553	0.02396	0.01727	0.03503	0.01776	39
0.00706	0.01041	0.00813	0.00662	0.01215	0.14680	0.02736	0.00781	0.01331	0.01328	40
0.00377	0.00494	0.00490	0.00334	0.00337	0.01134	0.00400	0.00291	0.00389	0.00337	41
0.00129	0.00355	0.00136	0.00166	0.00191	0.00335	0.00170	0.00188	0.00454	0.00195	42
0.03088	0.08817	0.03267	0.03074	0.04445	0.25037	0.07431	0.12706	0.36566	0.12626	43
0.00892	0.01402	0.01385	0.01753	0.00865	0.03292	0.05232	0.00932	0.01324	0.01413	44
0.02257	0.02852	0.02101	0.01669	0.03153	0.02026	0.02239	0.02194	0.02260	0.01964	45
0.16223	0.19756	0.15769	0.10934	0.16819	0.12828	0.18107	0.12476	0.13396	0.11995	46
0.02020	0.02442	0.01891	0.01788	0.01725	0.02978	0.02059	0.03309	0.03231	0.02283	47
0.13862	0.14132	0.13868	0.11401	0.12789	0.12421	0.13560	0.09485	0.11413	0.13120	48
0.18143	0.17892	0.21130	0.15396	0.14789	0.15570	0.16307	0.12081	0.14023	0.13557	49
2.56302	2.95230	2.35378	2.00830	2.69206	2.57166	2.72645	2.61078	2.54385	2.60634	50

Table III – Total Requirements Table, Ontario, 1965 – Continued
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper Mills
	Industry	17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	0.04207	0.01413	0.01084	0.01151	0.03806	0.01251
2	Mining	0.01495	0.02149	0.01937	0.02331	0.01969	0.04813
3	Meat and Poultry	0.00489	0.00576	0.00295	0.00470	0.00376	0.00469
4	Dairy Products	0.00175	0.00185	0.00173	0.00189	0.00182	0.00169
5	Grain Mills	0.00488	0.00223	0.00160	0.00188	0.00435	0.00240
6	Biscuits and Bakeries	0.00073	0.00077	0.00075	0.00080	0.00076	0.00066
7	Sugar and Confectioneries	0.00056	0.00057	0.00040	0.00052	0.00049	0.00064
8	Other Food Industries	0.00785	0.00842	0.00263	0.00645	0.00423	0.01499
9	Soft Drinks	0.00053	0.00066	0.00046	0.00059	0.00049	0.00051
10	Distilleries, Breweries and Wineries	0.00129	0.00158	0.00148	0.00148	0.00143	0.00148
11	Tobacco and Tobacco Products	0.0	0.0	0.0	0.0	0.0	0.0
12	Rubber Products	0.00731	0.01568	0.00446	0.00552	0.00525	0.00431
13	Leather and Leather Products	0.00213	0.00150	0.00034	0.00155	0.00055	0.00040
14	Cotton Yarn and Cloth	0.21457	0.13107	0.00096	0.03597	0.00141	0.00122
15	Synthetic Textiles	0.16077	0.24741	0.00162	0.07102	0.00419	0.00216
16	Knitting Mills	0.03916	0.00104	0.00002	0.00006	0.00003	0.00002
17	Clothing Industries	1.04237	0.00086	0.00047	0.00047	0.00051	0.00036
18	Other Textile Mills	0.18347	1.26007	0.00202	0.04239	0.00305	0.00594
19	Sawmills	0.00228	0.00421	1.43056	0.07944	0.30833	0.00851
20	Furniture and Fixtures	0.00097	0.00594	0.00040	1.03304	0.00453	0.00017
21	Other Wood Industries	0.00311	0.00780	0.08195	0.06491	1.13363	0.02245
22	Pulp and Paper Mills	0.01856	0.02726	0.00685	0.01982	0.03379	1.35914
23	Paper Products	0.02018	0.02187	0.00599	0.03001	0.01387	0.01036
24	Printing and Publishing	0.02052	0.02582	0.02242	0.02343	0.02149	0.02896
25	Iron and Steel Mills	0.01008	0.01332	0.00914	0.05603	0.01837	0.00961
26	Other Primary Metals	0.01148	0.01925	0.00966	0.03088	0.02574	0.00990
27	Fabricated and Structural Metals	0.00094	0.00122	0.00090	0.06315	0.00140	0.00079
28	Metal Stamping, Pressing and Coating	0.00408	0.00520	0.00194	0.00462	0.00342	0.00370
29	Other Metal Fabricating Industries	0.01830	0.02566	0.02100	0.09983	0.04259	0.01933
30	Miscellaneous Machinery	0.00148	0.00109	0.00102	0.00139	0.00147	0.00102
31	Motor Vehicles and Aircraft	0.00565	0.00695	0.00668	0.00895	0.00767	0.00587
32	Other Transportation Equipment	0.00072	0.00086	0.00092	0.00301	0.00133	0.00078
33	Electrical Appliances	0.00049	0.00044	0.00030	0.00078	0.00049	0.00028
34	Electrical Industrial Equipment	0.00087	0.00096	0.00085	0.00095	0.00087	0.00078
35	Communication Equipment	0.00201	0.00287	0.00144	0.00558	0.00173	0.00194
36	Other Electrical Products	0.00251	0.00294	0.00241	0.00607	0.00266	0.00231
37	Clay, Lime and Cement	0.00194	0.00259	0.00209	0.00369	0.00344	0.00930
38	Other Non-metallic Mineral Products	0.00360	0.00524	0.00295	0.00999	0.02068	0.00367
39	Petroleum Refineries and Coal Products	0.01404	0.01871	0.02676	0.01505	0.01921	0.01910
40	Plastics and Synthetic Resins	0.01104	0.02290	0.00257	0.04215	0.00908	0.00461
41	Paint and Varnish	0.00280	0.00457	0.00271	0.01351	0.00367	0.00283
42	Pharmaceuticals and Medicines	0.00135	0.00200	0.00067	0.00136	0.00094	0.00132
43	Other Chemical Industries	0.07610	0.12992	0.01398	0.07620	0.03659	0.07739
44	Miscellaneous Manufacturing Industries	0.04061	0.02191	0.00631	0.01486	0.01666	0.00645
45	Construction, Maintenance and Repair	0.01612	0.01950	0.02395	0.01906	0.02202	0.02036
46	Transportation, Storage and Trade	0.13146	0.13414	0.19819	0.15732	0.22247	0.13513
47	Utilities	0.01658	0.02275	0.02387	0.02132	0.02483	0.06500
48	Communications and Other Services	0.10683	0.10410	0.10447	0.11592	0.11195	0.08917
49	Unallocated Sector	0.11012	0.13612	0.12697	0.12522	0.11884	0.11557
50	Total	2.38605	2.51322	2.19199	2.35764	2.32387	2.13790

Note: Figures may not add to total due to rounding.

Paper Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscellaneous Machinery	Motor Vehicles and Aircraft	Other Transportation Equipment	Industry No.
23	24	25	26	27	28	29	30	31	32	
0.01330	0.01115	0.00712	0.00802	0.00571	0.00805	0.00826	0.00744	0.00841	0.00798	1
0.04430	0.01220	0.16005	0.08320	0.06306	0.07728	0.05417	0.05509	0.03737	0.05011	2
0.00592	0.00606	0.00341	0.00332	0.00268	0.00351	0.00366	0.00322	0.00363	0.00403	3
0.00325	0.00348	0.00177	0.00173	0.00148	0.00183	0.00202	0.00184	0.00179	0.00169	4
0.00250	0.00208	0.00126	0.00135	0.00101	0.00151	0.00143	0.00129	0.00144	0.00132	5
0.00162	0.00157	0.00078	0.00076	0.00066	0.00079	0.00089	0.00081	0.00077	0.00073	6
0.00074	0.00080	0.00043	0.00041	0.00035	0.00048	0.00047	0.00042	0.00044	0.00041	7
0.01020	0.00607	0.00344	0.00350	0.00265	0.00636	0.00368	0.00339	0.00428	0.00338	8
0.00073	0.00092	0.00054	0.00048	0.00043	0.00050	0.00057	0.00048	0.00052	0.00047	9
0.00346	0.00237	0.00174	0.00142	0.00138	0.00147	0.00173	0.00133	0.00154	0.00136	10
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11
0.00642	0.00694	0.00512	0.00471	0.00410	0.00488	0.00643	0.00408	0.04074	0.00575	12
0.00067	0.00057	0.00041	0.00037	0.00032	0.00039	0.00050	0.00033	0.00088	0.00513	13
0.00312	0.00141	0.00084	0.00099	0.00068	0.00088	0.00122	0.00092	0.00690	0.00163	14
0.00742	0.00211	0.00144	0.00175	0.00118	0.00152	0.00313	0.00151	0.01804	0.00781	15
0.00004	0.00002	0.00002	0.00002	0.00001	0.00002	0.00002	0.00002	0.00004	0.00003	16
0.00047	0.00044	0.00036	0.00039	0.00029	0.00035	0.00041	0.00034	0.00042	0.00037	17
0.01305	0.00382	0.00212	0.00250	0.00162	0.00209	0.00309	0.00241	0.02423	0.00413	18
0.00753	0.00234	0.00173	0.00347	0.00262	0.00336	0.00608	0.00488	0.00503	0.01885	19
0.00024	0.00012	0.00009	0.00014	0.00007	0.00010	0.00041	0.00011	0.00032	0.00037	20
0.02147	0.00351	0.00210	0.00543	0.00175	0.00254	0.00702	0.00711	0.00339	0.00707	21
0.28364	0.09959	0.00708	0.01181	0.00505	0.01045	0.01025	0.01285	0.01034	0.00701	22
1.27793	0.01139	0.00734	0.03276	0.00571	0.01834	0.02069	0.03302	0.01651	0.00988	23
0.04284	1.07443	0.02793	0.02181	0.02217	0.02390	0.02784	0.02082	0.02426	0.02143	24
0.02059	0.01284	1.24239	0.11700	0.45854	0.51742	0.25652	0.27557	0.14693	0.26757	25
0.03914	0.01388	0.05077	1.51885	0.03920	0.12367	0.23816	0.16095	0.13268	0.11892	26
0.00101	0.00149	0.00101	0.00200	1.00122	0.00170	0.01524	0.00123	0.00210	0.00306	27
0.00597	0.00261	0.00253	0.00968	0.00207	1.00383	0.01107	0.00340	0.00870	0.00453	28
0.02656	0.03381	0.03353	0.08768	0.06140	0.08945	1.12202	0.05474	0.05926	0.17919	29
0.00122	0.00144	0.00123	0.00205	0.00108	0.00140	0.00655	1.01406	0.00714	0.00196	30
0.00785	0.01018	0.00819	0.02145	0.00752	0.00940	0.04154	0.00893	1.41744	0.03881	31
0.00102	0.00086	0.00112	0.00330	0.00129	0.00189	0.01684	0.00296	0.00251	1.20000	32
0.00046	0.00047	0.00043	0.00209	0.00052	0.00077	0.00621	0.00401	0.00920	0.00153	33
0.00105	0.00136	0.00102	0.00109	0.00083	0.00241	0.00194	0.00107	0.00388	0.00111	34
0.00277	0.00226	0.00188	0.00317	0.00143	0.00189	0.00418	0.00162	0.01292	0.00232	35
0.00318	0.00385	0.00573	0.00558	0.00337	0.00461	0.00530	0.00313	0.00923	0.00560	36
0.01194	0.00293	0.02549	0.02095	0.01027	0.01271	0.00980	0.00908	0.00725	0.00841	37
0.00807	0.00271	0.00231	0.00263	0.00164	0.00212	0.00282	0.00242	0.02372	0.00271	38
0.02699	0.00904	0.01137	0.03430	0.00689	0.01208	0.01512	0.01550	0.01341	0.01418	39
0.05768	0.00576	0.00288	0.00448	0.00252	0.00450	0.00453	0.00423	0.01070	0.00722	40
0.00376	0.00435	0.00318	0.00381	0.00546	0.01722	0.00768	0.01009	0.01450	0.00894	41
0.00180	0.00134	0.00094	0.00087	0.00068	0.00083	0.00089	0.00073	0.00094	0.00076	42
0.10741	0.03654	0.03124	0.03388	0.01790	0.02705	0.02554	0.02140	0.03679	0.02468	43
0.01931	0.00976	0.00689	0.00640	0.00543	0.00821	0.00895	0.00616	0.01597	0.02979	44
0.02412	0.02693	0.02224	0.03401	0.01643	0.02050	0.02296	0.02020	0.02210	0.02330	45
0.16971	0.10312	0.10591	0.15080	0.08599	0.11790	0.13469	0.12304	0.14942	0.13036	46
0.03161	0.02281	0.04956	0.05646	0.02573	0.03309	0.03102	0.02450	0.02293	0.03492	47
0.14121	0.24624	0.09635	0.10675	0.08449	0.11149	0.12301	0.12343	0.10594	0.10542	48
0.14953	0.21708	0.15788	0.12056	0.12574	0.12969	0.15336	0.11454	0.13467	0.11935	49
2.61479	2.02703	2.10318	2.54014	2.09266	2.42638	2.42997	2.17071	2.58164	2.49556	50

Table III – Total Requirements Table, Ontario, 1965 – Continued
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Electrical Appliances	Electrical Industrial Equipment	Communication Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non-metallic Mineral Products
	Industry	33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	0.00941	0.00811	0.00904	0.01161	0.01130	0.01060
2	Mining	0.06239	0.04395	0.03906	0.04879	0.12375	0.04415
3	Meat and Poultry	0.00442	0.00442	0.00475	0.00573	0.00443	0.00590
4	Dairy Products	0.00215	0.00184	0.00200	0.00248	0.00244	0.00231
5	Grain Mills	0.00168	0.00138	0.00156	0.00207	0.00193	0.00183
6	Biscuits and Bakeries	0.00094	0.00081	0.00088	0.00108	0.00106	0.00101
7	Sugar and Confectioneries	0.00054	0.00044	0.00050	0.00066	0.00059	0.00058
8	Other Food Industries	0.00565	0.00372	0.00493	0.00751	0.00545	0.00560
9	Soft Drinks	0.00062	0.00052	0.00057	0.00078	0.00068	0.00069
10	Distilleries, Breweries and Wineries	0.00182	0.00148	0.00144	0.00213	0.00214	0.00205
11	Tobacco and Tobacco Products	0.0	0.0	0.0	0.0	0.0	0.0
12	Rubber Products	0.00572	0.00549	0.01052	0.00835	0.00667	0.03594
13	Leather and Leather Products	0.00122	0.00553	0.00430	0.00126	0.00056	0.00627
14	Cotton Yarn and Cloth	0.00112	0.00102	0.00131	0.00151	0.00151	0.00228
15	Synthetic Textiles	0.00197	0.00167	0.00335	0.00288	0.00210	0.00602
16	Knitting Mills	0.00002	0.00002	0.00002	0.00005	0.00003	0.00003
17	Clothing Industries	0.00042	0.00036	0.00037	0.00053	0.00056	0.00046
18	Other Textile Mills	0.00281	0.00229	0.00287	0.00397	0.00298	0.00594
19	Sawmills	0.00307	0.00236	0.00283	0.00330	0.00263	0.00987
20	Furniture and Fixtures	0.00066	0.00015	0.00054	0.00057	0.00012	0.00048
21	Other Wood Industries	0.00637	0.00401	0.00517	0.00445	0.00391	0.00514
22	Pulp and Paper Mills	0.02002	0.00967	0.01602	0.02399	0.02454	0.03667
23	Paper Products	0.06107	0.01797	0.03446	0.04954	0.01940	0.05295
24	Printing and Publishing	0.02963	0.02346	0.02325	0.03480	0.03332	0.03282
25	Iron and Steel Mills	0.30904	0.18818	0.09157	0.15642	0.03496	0.01552
26	Other Primary Metals	0.18045	0.26436	0.36308	0.29447	0.01980	0.02083
27	Fabricated and Structural Metals	0.00130	0.00099	0.00111	0.00148	0.00136	0.00108
28	Metal Stamping, Pressing and Coating	0.00474	0.00383	0.00483	0.00755	0.00322	0.00407
29	Other Metal Fabricating Industries	0.05290	0.03617	0.03885	0.05746	0.05142	0.02946
30	Miscellaneous Machinery	0.00135	0.00116	0.00123	0.00163	0.00155	0.00132
31	Motor Vehicles and Aircraft	0.01046	0.01054	0.01158	0.01752	0.01005	0.00882
32	Other Transportation Equipment	0.00147	0.00122	0.00138	0.00173	0.00157	0.00098
33	Electrical Appliances	1.00941	0.00147	0.00077	0.00117	0.00054	0.00044
34	Electrical Industrial Equipment	0.07772	1.00320	0.01003	0.00171	0.00122	0.00117
35	Communication Equipment	0.01291	0.05557	1.15447	0.03813	0.00207	0.00266
36	Other Electrical Products	0.01237	0.08333	0.00849	1.02309	0.00363	0.01336
37	Clay, Lime and Cement	0.01012	0.00911	0.00917	0.01009	1.15233	0.05806
38	Other Non-metallic Mineral Products	0.00589	0.02496	0.02574	0.01280	0.01780	1.23213
39	Petroleum Refineries and Coal Products	0.01845	0.01417	0.01954	0.02094	0.02675	0.03090
40	Plastics and Synthetic Resins	0.02608	0.01301	0.03355	0.05884	0.00557	0.01350
41	Paint and Varnish	0.02196	0.00681	0.00909	0.01196	0.00389	0.00403
42	Pharmaceuticals and Medicines	0.00115	0.00086	0.00104	0.00167	0.00107	0.00138
43	Other Chemical Industries	0.04747	0.02971	0.04659	0.08566	0.02909	0.06161
44	Miscellaneous Manufacturing Industries	0.01043	0.01053	0.01054	0.05578	0.00889	0.01134
45	Construction, Maintenance and Repair	0.02197	0.01966	0.02226	0.02407	0.02678	0.02612
46	Transportation, Storage and Trade	0.14186	0.12155	0.13287	0.16828	0.20590	0.14763
47	Utilities	0.03244	0.02733	0.02761	0.03117	0.03458	0.06718
48	Communications and Other Services	0.12795	0.11527	0.13294	0.14539	0.14390	0.13380
49	Unallocated Sector	0.15548	0.13027	0.12374	0.18447	0.18727	0.17778
50	Total	2.51910	2.31389	2.45181	2.63150	2.22729	2.33476

Note: Figures may not add to total due to rounding.

Petroleum Refineries and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceu- ticals and Medicines	Other Chemical Industries	Miscel- laneous Manufac- turing Industries	Con- struction, Maintenance and Repair	Trans- portation, Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	49	
0.01176	0.03482	0.03344	0.02265	0.03878	0.01739	0.01326	0.02851	0.00398	0.02483	0.03288	1
0.68816	0.07029	0.04908	0.02937	0.08828	0.03122	0.04461	0.02246	0.01723	0.00902	0.02619	2
0.00548	0.02415	0.01651	0.00957	0.03057	0.00967	0.00305	0.00388	0.00180	0.01591	0.01708	3
0.00213	0.00332	0.00376	0.00436	0.00332	0.00277	0.00163	0.00246	0.00111	0.01104	0.00969	4
0.00201	0.00698	0.00771	0.00452	0.00737	0.00290	0.00184	0.00390	0.00068	0.00480	0.00608	5
0.00090	0.00112	0.00123	0.00171	0.00111	0.00117	0.00070	0.00087	0.00050	0.00516	0.00431	6
0.00058	0.00198	0.00215	0.00713	0.00203	0.00088	0.00039	0.00053	0.00024	0.00219	0.00232	7
0.00693	0.05335	0.07002	0.02803	0.05219	0.01171	0.00339	0.00332	0.00152	0.01137	0.01512	8
0.00068	0.00246	0.00135	0.00502	0.00248	0.00097	0.00040	0.00049	0.00027	0.00207	0.00317	9
0.00169	0.00242	0.00248	0.00350	0.00248	0.00233	0.00104	0.00202	0.00060	0.00089	0.01215	10
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11
0.00562	0.01458	0.01780	0.01251	0.01287	0.03824	0.00779	0.00676	0.00205	0.00314	0.03391	12
0.00075	0.00333	0.00120	0.00137	0.00215	0.01203	0.00059	0.00037	0.00016	0.00041	0.00254	13
0.00123	0.00226	0.00174	0.00186	0.00178	0.00672	0.00200	0.00275	0.00050	0.00294	0.00417	14
0.00205	0.00502	0.00382	0.00340	0.00392	0.01641	0.00436	0.00383	0.00075	0.00179	0.00792	15
0.00003	0.00010	0.00004	0.00004	0.00004	0.00056	0.00003	0.00008	0.00001	0.00002	0.00010	16
0.00051	0.00066	0.00058	0.00068	0.00061	0.00117	0.00041	0.00188	0.00015	0.00029	0.00199	17
0.00352	0.00708	0.00424	0.00474	0.00563	0.02176	0.00962	0.00481	0.00130	0.00327	0.01043	18
0.00315	0.00599	0.00271	0.00331	0.00377	0.02093	0.04248	0.00286	0.00605	0.00361	0.00434	19
0.00015	0.00037	0.00014	0.00018	0.00017	0.00197	0.00192	0.00014	0.00015	0.00022	0.00028	20
0.00360	0.00776	0.00318	0.00401	0.00448	0.02193	0.04238	0.00241	0.00343	0.00443	0.00480	21
0.00884	0.03332	0.02035	0.03585	0.03595	0.03669	0.01329	0.00843	0.00263	0.00537	0.03318	22
0.01352	0.04654	0.03220	0.07613	0.04997	0.03945	0.01719	0.01234	0.00302	0.00633	0.03193	23
0.02580	0.03892	0.04415	0.07455	0.03917	0.04302	0.01480	0.02065	0.00980	0.01527	0.19786	24
0.04988	0.03650	0.04426	0.03110	0.03712	0.05800	0.07217	0.01147	0.00823	0.00944	0.05005	25
0.03421	0.03586	0.02509	0.02318	0.03285	0.08015	0.08786	0.01055	0.00914	0.01031	0.05215	26
0.00183	0.00166	0.00122	0.00133	0.00153	0.00293	0.02593	0.00111	0.00195	0.00193	0.00301	27
0.02004	0.02880	0.05848	0.02981	0.03100	0.03527	0.01539	0.00324	0.00165	0.00268	0.00747	28
0.04665	0.03810	0.03665	0.04534	0.03755	0.05303	0.10597	0.02075	0.01414	0.01743	0.14674	29
0.00189	0.00188	0.00175	0.00201	0.00184	0.00248	0.00406	0.00190	0.00270	0.00186	0.00571	30
0.00836	0.01006	0.01047	0.01460	0.00987	0.01198	0.00964	0.01030	0.00294	0.00412	0.05130	31
0.00243	0.00141	0.00124	0.00131	0.00144	0.00183	0.00223	0.00350	0.00039	0.00047	0.00351	32
0.00052	0.00141	0.00059	0.00072	0.00061	0.00787	0.00207	0.00033	0.00025	0.00030	0.00212	33
0.00115	0.00199	0.00150	0.00196	0.00147	0.00596	0.00675	0.00084	0.00074	0.00088	0.00643	34
0.00307	0.01495	0.00622	0.00361	0.01472	0.00864	0.02210	0.00166	0.00192	0.00215	0.00821	35
0.00336	0.00683	0.00481	0.00632	0.00636	0.01495	0.01502	0.00258	0.00183	0.00224	0.01831	36
0.00784	0.00969	0.00595	0.00755	0.00586	0.00653	0.06383	0.00271	0.00478	0.00485	0.00524	37
0.00322	0.01309	0.00918	0.09108	0.01483	0.01721	0.01743	0.00209	0.00171	0.00246	0.01003	38
1.10870	0.06354	0.03867	0.02027	0.07946	0.02072	0.02547	0.02999	0.01104	0.00860	0.02108	39
0.00466	1.11515	0.07979	0.01324	0.02349	0.13673	0.00613	0.00315	0.00117	0.00233	0.01479	40
0.00866	0.01266	1.06584	0.00655	0.00703	0.01028	0.00855	0.00260	0.00158	0.00316	0.02035	41
0.00176	0.01040	0.00529	1.03327	0.01440	0.00238	0.00070	0.00070	0.00034	0.00161	0.00475	42
0.10734	0.88380	0.40191	0.10607	1.25476	0.14310	0.02495	0.01473	0.00676	0.01318	0.07088	43
0.00873	0.14772	0.02402	0.02456	0.02680	1.11662	0.01343	0.00672	0.00295	0.00607	0.04324	44
0.04870	0.03200	0.02546	0.02685	0.03125	0.02369	1.01718	0.03228	0.07257	0.06947	0.03784	45
0.20853	0.17580	0.17782	0.17904	0.17930	0.15392	0.18661	1.12274	0.04968	0.05946	0.38137	46
0.04592	0.04889	0.02860	0.02120	0.05460	0.02634	0.01641	0.01469	1.22646	0.00760	0.01952	47
0.13006	0.14919	0.16900	0.22186	0.14802	0.15790	0.11661	0.13973	0.08678	1.13676	0.39831	48
0.14284	0.19337	0.21040	0.30955	0.19135	0.20456	0.08036	0.11057	0.05311	0.07908	1.13717	49
2.78940	3.40155	2.75407	2.55686	2.59661	2.64495	2.17404	1.68667	1.62275	1.58276	2.98204	50

**Sectoral Classification of the 1965 Ontario Input-Output Table –
Industry Titles and Definitions on the Basis of the Standard Industrial Classification**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
1	Agriculture, Forestry and Fishing	011, 013, 015, 017, 019, 021, 031, 039, 041, 045, 047
2	Mining	058, 051, 052, 053, 054, 055, 056, 057, 059, 061, 063, 065, 066, 071, 073, 077, 079, 083, 087, 092, 094, 096, 098, 099
3	Meat and Poultry	101, 103
4	Dairy Products	105, 107
5	Grain Mills	123, 124, 125
6	Biscuits and Bakeries	128, 129
7	Sugar and Confectioneries	131, 133
8	Other Food Industries	111, 112, 135, 139
9	Soft Drinks	141
10	Distilleries, Breweries and Wineries	143, 145, 147
11	Tobacco and Tobacco Products	151, 153
12	Rubber Products	161, 163, 169
13	Leather and Leather Products	172, 174, 175, 179
14	Cotton Yarn and Cloth	183
15	Synthetic Textiles	201
16	Knitting Mills	231, 239
17	Clothing Industries	243, 244, 245, 246, 247, 248, 249
18	Other Textile Mills	193, 197, 211, 212, 213, 214, 215, 216, 218, 219, 221, 223, 229
19	Sawmills	251
20	Furniture and Fixtures	261, 264, 266, 268
21	Other Wood Industries	252, 254, 256, 258, 259
22	Pulp and Paper Mills	271
23	Paper Products	272, 273, 274
24	Printing and Publishing	286, 288, 289, 287
25	Iron and Steel Mills	291
26	Other Primary Metals Industries	292, 294, 295, 296, 297, 298
27	Fabricated and Structural Metals	302
28	Metal Stamping, Pressing and Coating	304
29	Other Metal Fabricating Industries	301, 303, 305, 306, 307, 308, 309, 315
30	Miscellaneous Machinery	311, 316, 318
31	Motor Vehicles and Aircraft	321, 323, 324, 325
32	Other Transportation Equipment	326, 327, 328, 329
33	Electrical Appliances	331, 332
34	Electrical Industrial Equipments	336
35	Communication Equipment	334, 335, 338
36	Other Electrical Equipment	337, 339
37	Clay, Lime and Cement	341, 343, 345, 347, 348, 351, 352, 353
38	Other non-metallic Mineral Products	354, 355, 356, 357, 359
39	Petroleum Refineries and Coal Products	365, 369
40	Plastics and Synthetic Resins	373
41	Paint and Varnish	375
42	Pharmaceuticals and Medicines	374
43	Other Chemical Industries	371, 372, 377, 378, 379
44	Miscellaneous Manufacturing Industries	381, 382, 383, 384, 385, 393, 395, 397, 398, 399
45	Construction, Maintenance and Repair	404, 406, 409, 421

**Sectoral Classification of the 1965 Ontario Input-Output Table —
Industry Titles and Definitions on the Basis of the Standard Industrial Classification
(continued)**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
46	Transportation, Storage and Trade	602, 604, 606, 608, 611, 613, 614, 615, 616, 617, 618, 619, 621, 622, 623, 624, 625, 626, 627, 629, 631, 642, 647, 649, 652, 654, 656, 658, 663, 665, 667, 669, 673, 676, 678, 681, 691, 692, 693, 694, 695, 696, 697, 699, 501, 502, 504, 505, 506, 507, 508, 509, 512, 515, 516, 517, 519, 524, 527
47	Utilities	572, 574, 576, 579
48	Communications and Other Services	543, 544, 545, 548, 801, 803, 805, 807, 809, 821, 823, 825, 827, 828, 842, 851, 853, 859, 871, 872, 873, 874, 875, 876, 877, 878, 879, 894, 896, 897, 702, 704, 731, 735, 861, 862, 864, 866, 869, 737, 831, 891, 893, 899
49	Unallocated Sector	

Selected Economic Indicators

34

Leading Indicators

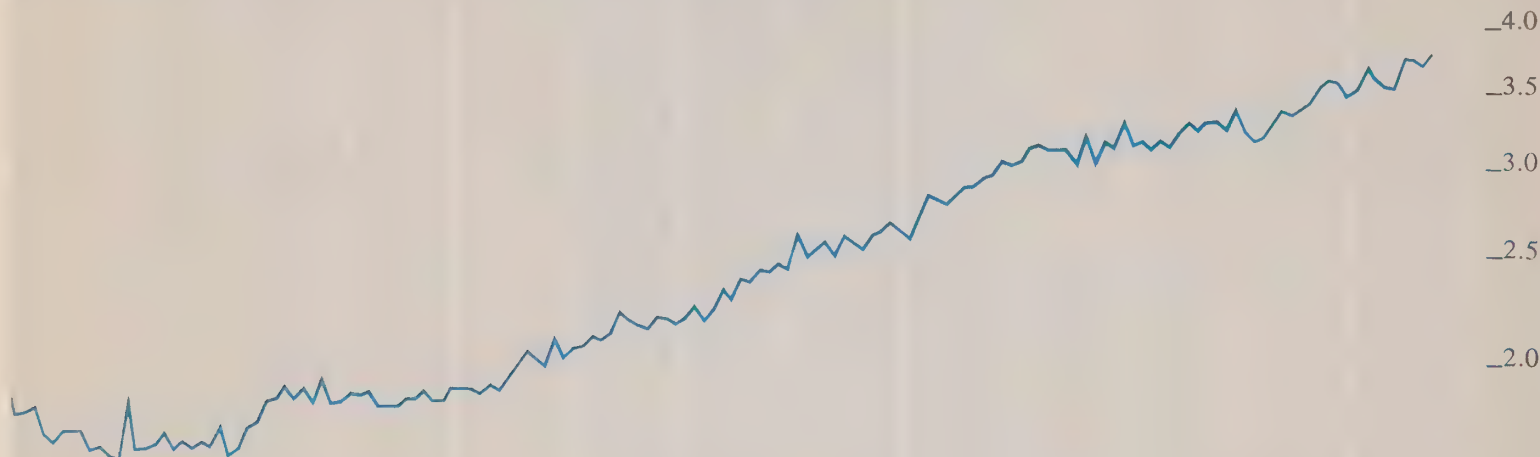
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)

Number
Scale A



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

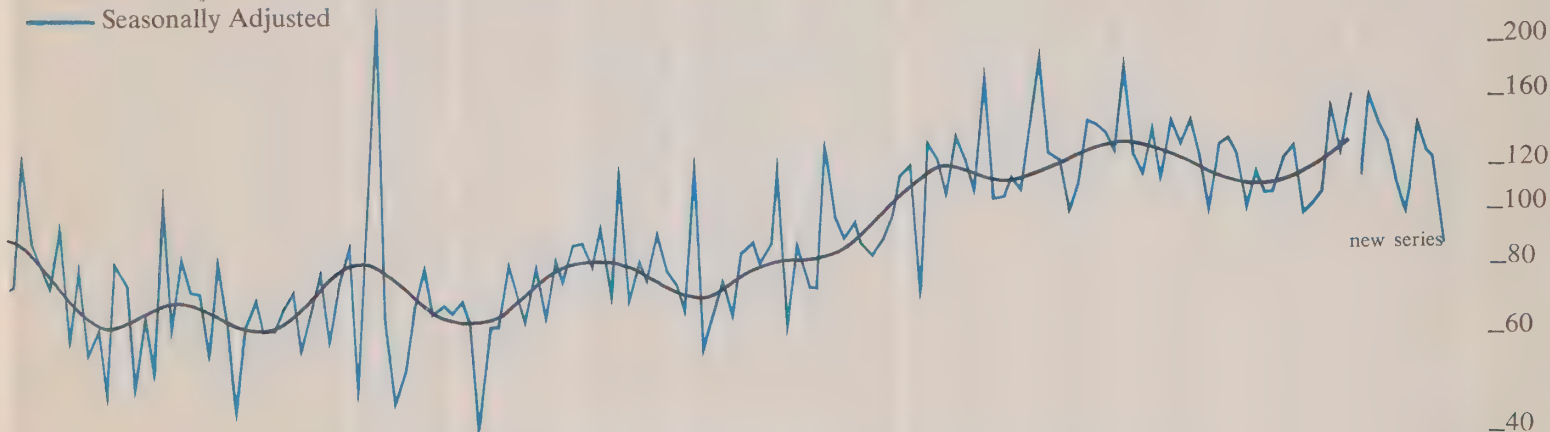
\$ Billion
Scale L1



Commercial/Institutional and Industrial Construction Contracts, Ontario

— Trend Cycle
— Seasonally Adjusted

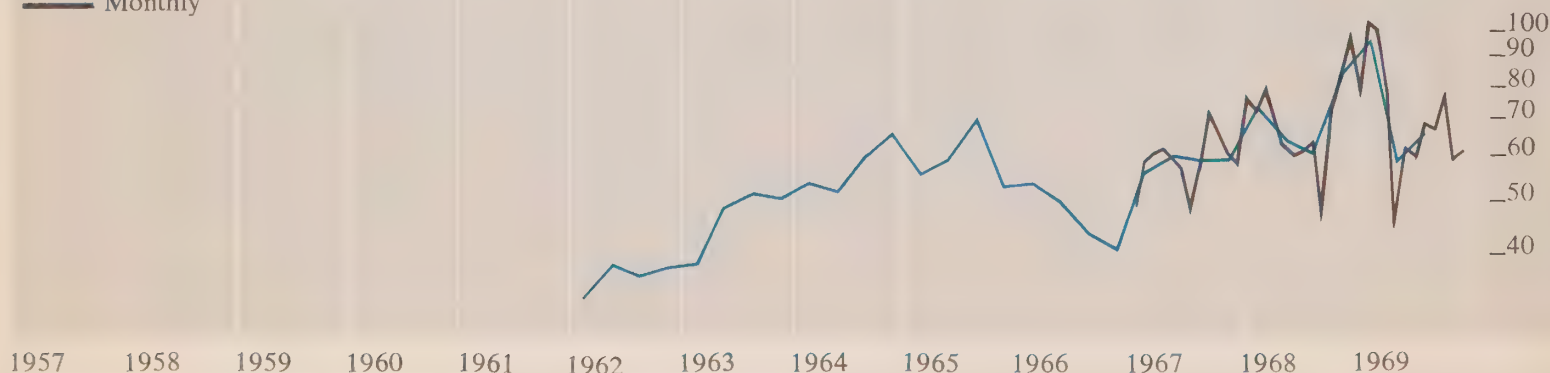
\$ Million
Scale L2



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

— Quarterly
— Monthly

Thousand
Scale L2



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
Scale L1
_30
_25
_20
_15
_14
_13



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

Index
1956 = 100
Scale L2
_180
_160
_140
_120
_100

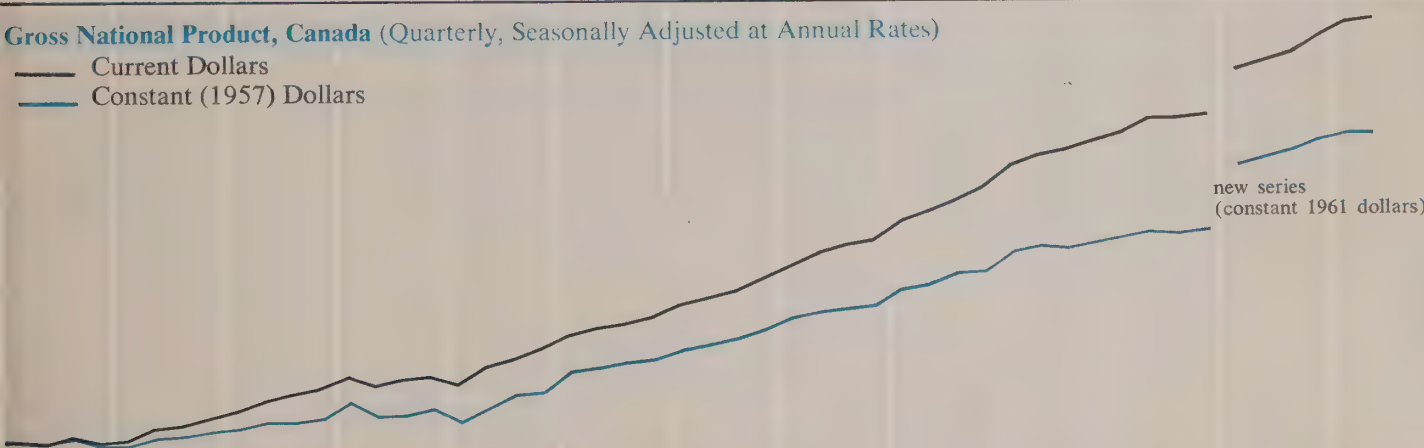


Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

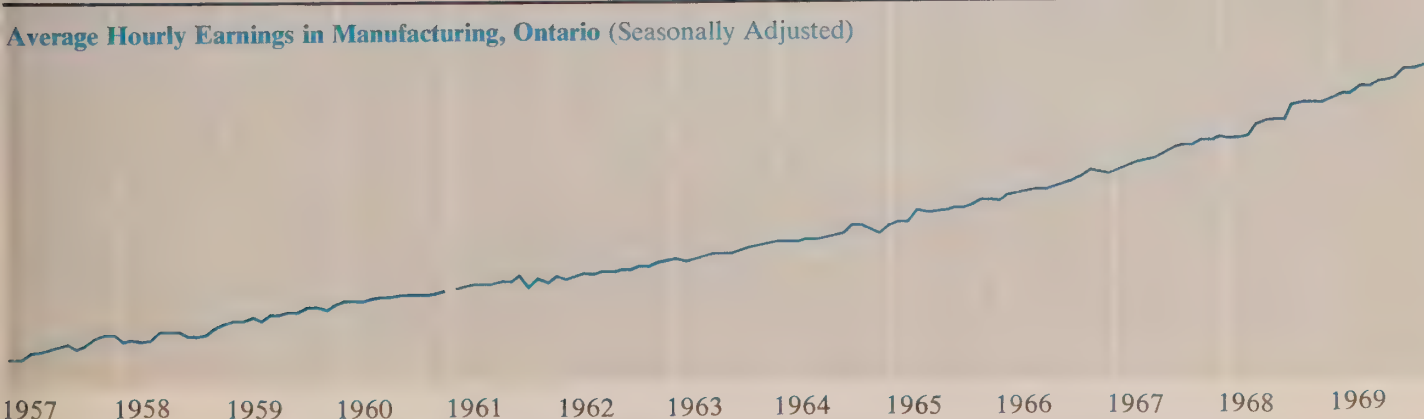
— Current Dollars
— Constant (1957) Dollars

\$ Billion
Scale L1
_70
_60
_50
_40
_35



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

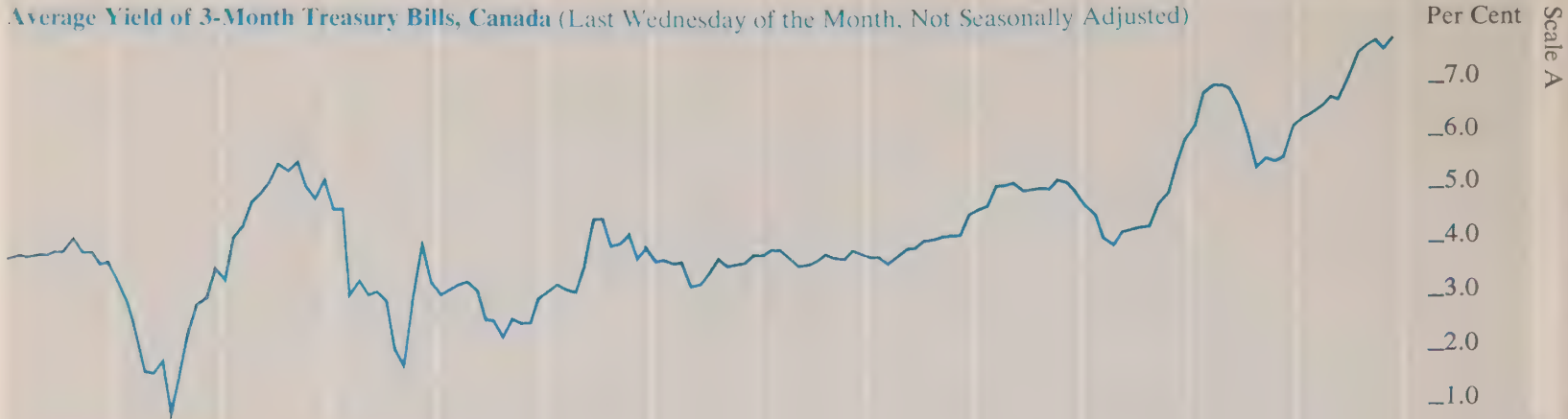
Dollars
Scale L1
_3.00
_2.50
_2.00



1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969

Coincidental and Lagging Indicators

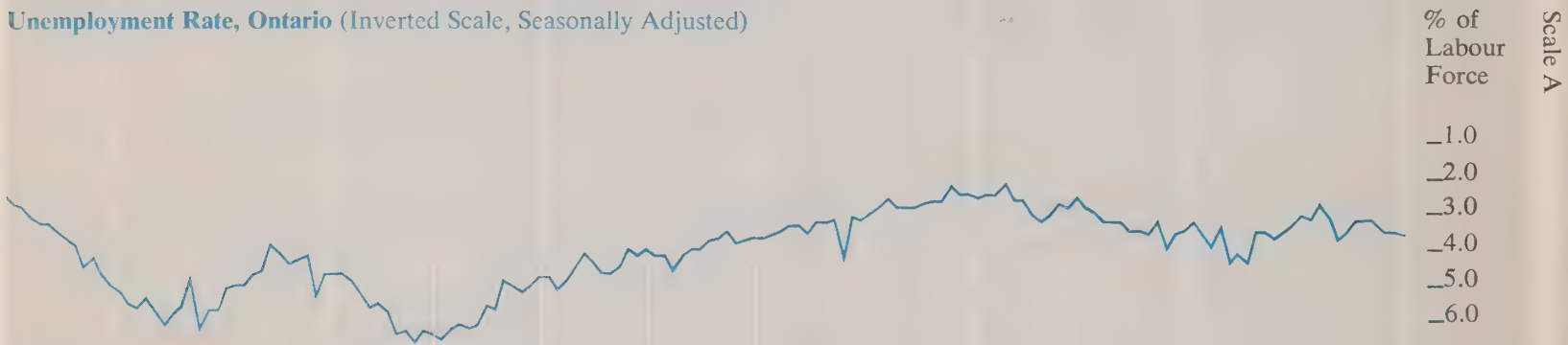
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



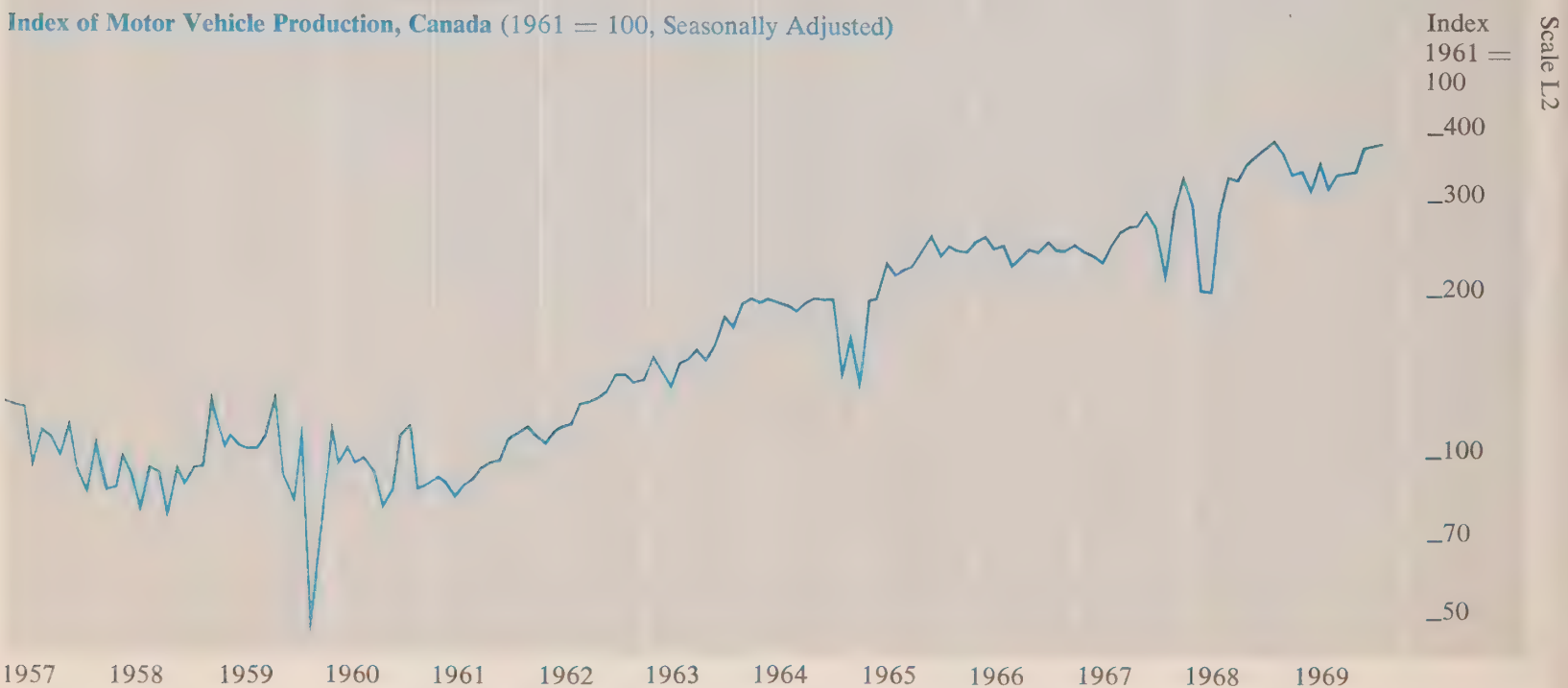
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)



	1969													
	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Leading Indicators														
Average Weekly Hours Worked in Manufacturing	40.7	40.1	40.5	40.4	40.5	40.1	40.4	40.1	40.2	39.6	40.3	39.9	39.9	
New Orders in Manufacturing Industries ^c	3,577	3,430	3,518	3,693	3,575	3,539	3,564	3,743	3,741	3,690	3,770	3,634	3,741	
Commercial/Institutional and Industrial Construction Contracts														
Urban Housing Starts (Annual Rate)	125.0	155.0	111.9	157.9	140.6	126.1	112.8	93.9	144.0	127.0	123.2	86.6		
Money Supply ^c	83,500	98,200	80,800	109,700	102,400	79,900	45,300	63,900	60,800	69,300	67,300	78,300	59,100	61,400
T.S.E. Industrial Index ^u	27,124	27,400	27,669	27,927	28,251	28,331	28,336	28,638	28,324	28,292	28,403	28,472	28,680	
Business Failures ^u	187.29	188.93	192.47	185.20	190.58	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37
Business Failures — Liabilities ^u	48	34	57	59	55	58	48	35	32	51	52	64	54	53
	2.5	1.2	2.9	3.2	2.2	3.2	1.9	2.0	0.9	2.6	4.8	3.4	4.6	2.2
Coincidental and Lagging Indicators														
Gross National Product ^c (Annual Rate)		74,524			76,608			77,432			78,736			
Average Hourly Earnings in Manufacturing	2.79	2.81	2.84	2.84	2.88	2.89	2.92	2.93	2.94	2.97	2.97	2.99	3.02	
3-Month Treasury Bill Rate ^{c,u}	5.66	6.24	6.38	6.43	6.58	6.80	6.74	7.13	7.62	7.69	7.77	7.60	7.76	
Cheques Cashed in Clearing Centres ¹	5,846	5,757	5,820	6,032	6,428	6,243	6,066	6,152	6,458	6,560	6,570	6,526	6,521	
Retail Trade	862	853	879	886	862	866	866	875	884	886	901	892	895	895
Labour Force	3,026	2,977	3,010	3,037	3,019	3,038	3,071	3,035	3,028	3,004	3,027	3,035	3,030	3,064
Employed	2,923	2,879	2,928	2,947	2,940	2,948	2,958	2,926	2,935	2,910	2,932	2,930	2,927	2,957
Unemployed	103	98	82	90	79	90	113	109	93	94	95	105	103	107
Unemployed as % of Labour Force	3.4	3.3	2.7	3.0	2.6	3.0	3.7	3.6	3.1	3.1	3.1	3.4	3.4	3.5
Wages and Salaries	1,223	1,224	1,239	1,256	1,264	1,271	1,288	1,295	1,318	1,303	1,309	1,314		
Index of Industrial Employment	128.6	129.3	130.5	131.2	131.5	131.4	131.4	131.0	129.6	129.3	129.6	130.7	132.7	132.9
Index of Industrial Production ^c	165.7	166.0	165.8	168.0	171.3	167.7	167.0	167.1	166.8	164.5	165.9	165.6	169.2	171.5
Total Manufacturing ^c	165.9	165.7	164.2	167.5	171.3	167.3	168.5	169.0	169.3	166.5	166.8	166.7	169.3	170.2
Non-Durables ^c	148.0	149.8	147.6	150.8	153.6	150.2	150.6	151.1	151.6	152.5	153.0	152.4	153.1	153.6
Durables ^c	187.8	185.0	184.5	187.8	193.0	188.2	190.3	190.8	191.0	183.7	183.8	184.1	189.1	190.5
Mining ^c	155.1	154.4	159.7	160.6	162.1	155.7	145.5	142.6	138.9	136.2	141.8	140.3	151.8	163.1
Electric Power and Gas Utilities ^c	179.7	186.7	189.5	184.3	184.7	186.2	186.1	187.1	189.0	190.1	194.6	195.5	194.6	195.6
Primary Energy Demand (Annual Rate)	57.89	59.81	59.83	58.45	59.49	59.20	58.54	59.12	60.28	58.83	58.39	59.09	59.56	63.13
Exports (including re-exports) ^c	1,203.2	1,201.8	1,204.8	1,243.8	1,295.7	1,194.2	1,233.6	1,212.5	1,196.0	1,161.7	1,319.8	1,263.0	1,253.0	1,328.9
Imports ^c	1,084.3	1,106.0	1,149.0	1,194.2	1,178.3	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,243.1	1,191.7	1,225.0	1,214.0
Unclassified Indicators														
Foreign Exchange Reserves ^{c,u}	2,672	2,827	2,864	2,820	2,779	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	
Industrial Materials Price Index ^{c,u}	257.1	258.9	261.4	263.5	264.1	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5
Consumer Price Index ^{c,u}	121.9	122.3	122.6	122.6	123.2	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.





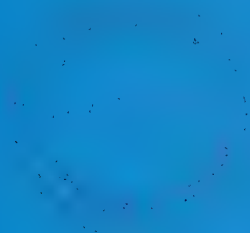
Ontario Economic Review

Government of Ontario
Economic Review

March/April 1970
Volume 8, Number 2

Treasury Department—Finance and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
H. Ian Macdonald, Deputy Minister



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The Ontario Economy

Economic Aspects of Environmental Quality for Ontario

H. J. McGonigal, *Economist*
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Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

About the Review

The feature article for the March/April issue of the *Ontario Economic Review* examines some of the economic aspects of pollution abatement and environmental quality improvement.

In recent years, changes in environmental quality resulting from pollution have occurred in such quantity and at such a rapid rate that neither neutralization nor accommodation is possible. Accordingly, one of the most urgent challenges now facing mankind is to halt and reverse this growing deterioration in the environment. However, the complex phenomenon of pollution is intimately interrelated with the goals and activities of advanced industrial societies. The desire for economic growth results jointly in greater affluence, and through the industrial sources of wealth, more effluents. The problem is therefore determination of the trade-offs necessary to properly order the priorities of environmental quality and economic growth.

This article is drawn in part from background documents prepared for the Federal-Provincial Conference in Ottawa, February 16-17, 1970. The problems of pollution and the proposed Canada Water Bill were among the topics receiving major attention at that conference.

Mr. McGonigal is an economist with the Economic Planning Branch, Policy Planning Division of the Department of Treasury and Economics.

Indicator Charts, Pages 10-12

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 10-12 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

Ontario Budget 1970

In his fourth Budget Statement to the Ontario Parliament on March 31, Treasurer Charles MacNaughton announced his 1970-71 budget will, as promised, achieve a balance with no tax increases. Despite a 14.1 per cent increase in spending a balanced budget will be maintained through rapidly increasing revenues from existing taxes. Based on total outlays of \$3,728 million and anticipated revenues of \$3,739 million in 1970-71 a surplus of \$11 million is forecast.

Describing his budget as "moderately expansionary", reflecting his concern that tight money and fiscal policies could bring about a recession and higher unemployment, Mr. MacNaughton announced five new programs directed at priority concerns of the province; the plight of pensioners, pollution, housing and municipal finance.

Pensioners who qualify for the federal Guaranteed Income Supplement and maintain an independent household will receive up to \$100 in property tax relief in addition to the recently revised basic shelter grants. The supplementary tax relief grants will be available to tenants as well as homeowners, but not to pensioners living in institutions or in subsidized senior citizen housing. Pensioners in these categories are already sheltered from rising property tax burdens. The supplement will benefit approximately 200,000 tenants and homeowners.

This new program recognizes that pensioners with little or no outside income have been hardest hit by inflation and are least able to pay property taxes and rising rents.

A grant and loan system to encourage industry to reduce pollution was also introduced. Incentives for pollution control include tax-expenditure grants equivalent to the five per cent retail sales tax on approved equipment; loans to small businesses to purchase anti-pollution equipment; tax-related grants to municipalities, school boards, hospitals and universities; capital assistance to small municipalities for sewage treatment plants and water pipelines; and accelerated depreciation allowances similar to those announced recently by the federal government. The new pollution incentives will add approximately \$15 million to the cost of existing anti-pollution programs of the government.

As part of its expanding program to provide a high level of health care in Ontario, the province intends to broaden the benefits available under the Ontario Health Services

Insurance Plan. Beginning on July 1, 1970 certain services provided by chiropractors, podiatrists and osteopaths will be eligible as insured service under OHSIP. It will be necessary, however, to prescribe annual limits on these services. The specific details of this extended coverage will be outlined at a later date by the Minister of Health.

To fortify the supply of mortgage money for home ownership the Ontario Government proposes to set up a \$50 million capital fund under the Housing Corporation Limited to provide first and second mortgages to purchasers of new dwellings. This initial allocation of \$50 million will finance approximately 3,000 mortgages. The interest rate on these mortgages will be the same as the rate for direct loans made by the Central Mortgage and Housing Corporation. The terms will include a maximum loan of 95 per cent of the lending value of the dwelling and repayment periods up to 35 years.

Continuing the staged program of provincial-municipal tax reform which was outlined in detail in Ontario's 1969 white paper the province will this year pay an additional \$125 million to help local authorities maintain or reduce present property taxes. The \$125 million covers new or increased grant programs in education, roads, servicing projects and regional government; the cost of provincial assessment and the initial step toward broadening the municipal tax base. More than half of the additional amount will go to school boards. Education Minister William Davis announced recently that the level of grants will be increased from 46.5 per cent to 51.5 per cent of school board expenditures.

The property assessment function, which the province took over from municipalities on January 1, 1970, will cost \$21 million. Increased grants for road expenditures by cities and separated towns are estimated at \$12 million. Regional and district governments will receive over \$12 million in increased assistance. Subsidies for amortization of sewerage and water projects, and water pipelines will cost \$1 million.

For the first time, municipalities will be able to collect revenues from universities which previously were exempt from property taxes. The province will provide \$2.5 million in grants, equivalent to \$25 per full-time pupil, to 17 cities which service university properties. The interim tax formula of \$25 per student will be replaced by the normal method of taxing when university properties

have been evaluated under the province's reassessment program.

The government's long-run plan is to pay full local taxes on all properties of the province, its agencies and the institutions it supports. The program will be phased in as revenues become available to finance it.

The government will also establish a new loan fund of \$10 million for municipalities with populations under 10,000, through the Ontario Municipal Improvement Corporation. Borrowing problems of larger municipalities will be reviewed to determine their needs for debt-raising capacity.

In addition, as mentioned above, the province will provide municipalities, schools, hospitals and universities with grants equivalent to the Ontario retail sales tax on purchases of approved pollution control equipment, water treatment facilities and incinerators.

Tax Changes

Reversing recent trends toward ever increasing taxes Mr. MacNaughton announced selective tax relief in three major areas: succession duties; retail sales tax on certain production goods; and corporation tax relief for environmental pollution control.

As of midnight March 31, 1970 the succession duty exemption for widows is raised from the present \$75,000 to \$125,000. This will mean that less than one per cent of the estates assessed will involve duty payable by a widow. The same exemption will be granted to widowers and, under certain circumstances, to surviving common-law wives and husbands. The changes will also provide for relief on a pension benefit transferred to the surviving spouse. Previously the annuity was valued on the basis of the widow's life expectancy. An amendment will provide for an advantageous reassessment if the widow dies or remarries within four years of the death of her husband.

The Treasurer stated that the increased exemptions are a move toward his 1969 commitment to phase out succession duties with the introduction of a capital gains tax. He also expressed concern that the federal tax proposals, which include a capital gains tax, did not provide any compensating relief in estates taxation.

The second area of tax relief pertains to the application of the retail sales tax to certain production goods. In 1969 the retail sales tax was extended to cover production machinery in general. Following intensive

analysis of this area the government is now prepared to eliminate the sales tax on short-life production tools such as jigs, dies, explosives and fire bricks. This amendment specifies a variety of production items that are subject to rapid replacement and high wear-and-tear. The exemption will help to reduce the cost of goods, particularly in those industries where short-life tools account for a high proportion of production expenses.

The third area of tax relief relates to the high priority that has been given to the problem of bringing all forms of environmental pollution under control. Ontario now joins the federal government in providing for accelerated write-off of the capital costs of industrial pollution control equipment. These investments can be depreciated in two years under corporation tax provisions of both governments.

Federal Budget — 1970-1971

Finance Minister E. J. Benson presented his third budget to Parliament on March 12, 1970. Reviewing the current economic setting, Mr. Benson said that although budgetary analysis indicates the pace of the economy is slowing rapidly the pressure of rising costs and prices is still unacceptably strong. He also predicted that in spite of the variety of restraining measures introduced over the past 18 months inflation will continue to be a difficult and persistent problem throughout 1970. Accordingly, he proposes additional specific restraints upon the economy to maintain the pressure against price and cost increases.

As alternatives to tax increases — which are absent in this budget — the Finance Minister brought forth two special measures to reinforce the fight against inflation.

The first concerns commercial construction. Singling out the construction industry as a leader in the inflationary spiral, even though the total volume of construction has not increased significantly since 1966, Mr. Benson called for a continuation to the end of 1970 of the capital cost allowance deferrals introduced in June 1969. This proposal singles out commercial construction in the urban centres of over 50,000 population in Ontario, Alberta and British Columbia and postpones for two years the right to claim depreciation for tax purposes on commercial construction begun in the specified centres.

The second proposal concerns measures to cut back the rapid growth in the use of consumer credit which rose to a record total of

\$10.7 billion at the end of 1969. This was \$1.2 billion more than the amount outstanding at the end of 1968 and represented an increase of 13.0 per cent. The amount outstanding annually through sales financed by consumer credit has increased at an average of 11.0 per cent a year through the Nineteen Sixties.

Under the new regulations, which will be enacted into law in the House of Commons in six to eight weeks, credit sales of more than \$100 will require a minimum of 20 per cent down payment if they are being financed for more than one year. Repayment is required within 24 months in the case of all such purchases, except automobiles. On automobile purchases the repayment period is extended to 30 months and the amount received on a trade-in of another car will be allowed to count as part of the 20 per cent down payment, however this will not apply on the purchase of appliances.

The purpose of the proposed action is to limit the growth of consumer expenditures in the present inflationary situation not only on consumer durables but other goods and services such as travel.

Other budget highlights include:

- An extension of the 50 per cent rate of capital cost allowance on facilities to prevent, reduce or eliminate water pollution to the end of 1973. The two-year write-off will also be available for air pollution abatement facilities for the first time.
- Real growth in the gross national product is expected to be approximately 3.0 per cent this year, compared to 4.8 per cent in the preceding two years. Profits will decline, unemployment and labour unrest will increase, and prices are expected to rise almost as much as last year's jump of approximately 4.2 per cent. Unemployment is expected to increase by less than one percentage point to somewhere below a rate of 5.7 per cent, compared to 4.7 per cent last year.
- A budget surplus of \$250 million in the fiscal year 1970-71, based on budgetary revenues of \$13.15 billion and expenditures of \$12.9 billion. The surplus in the current fiscal year, the first in 13 years, is \$355 million, based on revenues of \$12.2 billion and expenditures of \$11.9 billion.
- Major increases in loans for housing, farmers, nuclear energy projects, foreign aid and regional economic expansion will increase net non-budgetary cash requirements to \$775 million in the coming fiscal

year, compared to \$475 million in the current year.

Increased government borrowing to meet the requirements of the expanded lending programs will probably offset to some extent the recent tendency for interest rates to decline. However, Mr. Benson predicts that the government's bank balances will stand at about \$1.0 billion at the end of the current year which should provide enough leeway for the government to time its borrowing so as not to unduly influence the capital market.

The Gross National Product in 1969

The Canadian economy maintained its pace through 1969 despite the imposition of restrictive fiscal and monetary measures and numerous labour disputes which resulted in a record number of man-hours lost. Recently published DBS figures indicate that the value of final goods and services produced rose by 9.3 per cent to a level of \$78.1 billion. The implicit price deflator for GNP rose 4.2 per cent, slightly more than the high increase of 4.0 per cent in 1968. In real terms, gross national product rose by 4.8 per cent, the same rate as in 1968.

Using the purchasing value of the Canadian dollar in 1961 as a base, GNP is \$60.8 billion. This is an increase of 4.8 per cent from the corresponding figure for 1968.

In the first quarter of 1969 widespread buoyancy of demand gave a strong initial impetus to the economy. Although this was followed by a pause in the second quarter, when the value of production rose only marginally, good advances were recorded in the third and fourth quarters. However, reviewing the pattern of growth in the last five quarters some evidence of an overall lessening in demand pressure is evident particularly in the second quarter when as a result of a 1.1 per cent price increase the volume of physical production declined by two-tenths of one per cent.

In the third quarter GNP rose by 1.7 per cent to reach a level of \$78.7 billion. This was above the advance of 0.9 per cent in the second quarter but lower than the average gain of 2.2 per cent realized since the first quarter of 1968. The third quarter was characterized by strong investment demand by businesses, increased exports, and a lower than average rate of increase in consumer demand. Although new residential construction declined after unusually high rates of increase in the first half of the year, spending on plant and equipment rose by 5.0 per cent.

This increase, the largest since the first quarter of 1968, was fairly evenly distributed between non-residential construction and machinery and equipment. Personal expenditure on goods and services rose by 1.5 per cent, the same rate as in the second quarter. This compared with increases of 2.0 per cent and over in prior quarters. A continued easing of demand pressure in consumer markets occurred despite an 8.0 per cent rise in new car sales, reflecting the earlier introduction of new models in 1969.

In the final quarter of 1969, GNP rose by 2.0 per cent to a level of \$80.3 billion, seasonally adjusted at annual rates. This increase was only slightly more than that realized in the third quarter. After allowing for a price increase of 0.5 per cent, the rise in physical volume of production was 1.4 per cent.

The pattern of demand in the fourth quarter was quite uneven. Personal expenditures on goods and services were very strong, accounting for roughly half of the increase in total demand. However, the 2.5 per cent increase in the expenditure on goods was concentrated in non-durable goods as purchases of many durables particularly new cars declined. Automotive products and machinery made up a dominant proportion of the 5.5 per cent increase in exports.

In contrast to its strong performance in the summer quarter, business capital formation rose only 1.0 per cent. Within this category, residential construction declined marginally, while non-residential construction and machinery and equipment rose at much lower rates than in the third quarter. In constant dollars, business gross fixed capital formation was practically unchanged from the third quarter level, as the small increase in machinery and equipment was entirely offset by declines in residential and non-residential construction.

On the income side in the fourth quarter a lower rate of increase in labour income was experienced as well as a second consecutive fall in corporation profits. The rise in wages and salaries of slightly more than 1.0 per cent was the smallest in two years. Preliminary data on corporation profits indicate a further decline of 2.0 per cent after a 7.0 per cent decrease in the third quarter.

While the performance of the economy in 1969 was somewhat uneven when viewed on

a quarterly basis the year as a whole presented a fairly balanced picture of growth. According to the Dominion Bureau of Statistics the two major developments were an acceleration in the rate of consumer spending and renewed high rates of business investment in plant and equipment after two years of decline. With the economy performing vigorously throughout the year, employment grew by 3.4 per cent, the same rate as the labour force itself. Consequently there was no reduction in the 4.8 per cent unemployment rate which carried over from 1968. Personal expenditure on consumer goods and services rose by 9.5 per cent to \$46.4 billion, an increase of almost \$4.0 billion from the previous year. This compares with an 8.5 per cent increase in 1968 and represents the largest percentage increase in the current expansion. Although much of the increased expenditure reflected price movements rather than real gains, the constant dollar estimates show spending rose 5.5 per cent — the largest increase since 1965. Thus consumer spending in 1969 was more than maintained regardless of sharply increasing income taxes and historically high interest rates. However, high interest rates may have affected spending on more costly consumer durables particularly automobiles, which with a 4.0 per cent rise were one of the few major items to show a substantially smaller rate of growth than in 1968 when the increase was 10.0 per cent. In our consumption-oriented economy, the purchase of cars and major household appliances is a source of instability since at very high interest rates, the cost of credit does adversely affect consumer borrowing. Reduced demand for major durables and housing could easily be an important feature of any adjustment in the economy's performance in 1970, especially since competing savings instruments have become very attractive as an alternative to more consumption.

After the very high rates of investment of 15 to 20 per cent that prevailed in the mid-sixties, business gross fixed capital formation registered a small decline in 1967 and a moderate 3.0 per cent increase in 1968. In 1969 capital investment rose by 9.0 per cent to \$14.0 billion. Business residential construction made a further substantial gain of 16.5 per cent versus 17.5 per cent in 1968 and accounted for nearly half of the total increase.

The upswing in activity in residential construction starting in the spring of 1967 and accelerating through 1968 slowed this year as a result of tight money and high mortgage rates. In Ontario, these combining factors contributed to a sharp drop in the number of anticipated housing starts with the result that in 1969 total starts exceeded those of 1968 by less than 1.0 per cent.

The acceleration in the rate of business gross fixed capital formation was due to a 7.0 per cent increase in investment in plant and equipment, a marked contrast to the declines of 1.5 per cent in 1968 and 0.5 per cent in 1967. In the case of non-residential construction, the increase of 5.0 per cent was considerably smaller than that indicated by the mid-year forecast of intentions of close to 15.0 per cent. In real terms non-residential construction declined by 3.0 per cent.

The deficit in Canada's balance of trade in goods and services increased from \$244 million in 1968 to \$938 million in 1969. The rate of increase of imports accelerated while that of exports declined. Exports of goods and services totalled \$18.4 billion, up from \$16.7 billion, but imports rose to \$19.3 billion from \$16.9 billion. One reason for the large increase in service imports was a 27.0 per cent increase in Canadian tourist and travel expenditures abroad last year.

On the income side, wages and salaries rose by 12.0 per cent to \$43.1 billion from \$38.5 billion in 1968, the largest increase since 1966. Within the year, however, there was a deceleration in the quarterly rate of increases in labour income, from a 3.5 per cent increase in the last quarter of 1968 to one of less than 2.0 per cent in the fourth quarter of 1969.

The most notable economic adjustment in 1969, which has important implications for the performance of the economy in 1970, was the substantial moderation in consumer spending growth in the last half of the year as employment turned down, consumer credit tightened and prices increased. This marked slowdown in the growth of personal disposable income during 1969 is expected to continue into 1970 and should contribute to an even more cautious tone in consumer spending and borrowing. This trend represents one of the first clear signs that restraining budgetary policies at both the federal and provincial levels have begun to reduce inflationary expectations.

Economic Aspects of Environmental Quality for Ontario

H. J. McGonigal, *Economist*
Department of Treasury and Economics

"One of the great challenges we face during the Nineteen Seventies is to restore (ecological) balance. The challenge to reduce and prevent pollution is, of course not that of Ontario alone. It is world-wide. But it is one to which the people of Ontario can make — indeed must make — a major contribution."¹

Pollution in its widest aspects has become a universal concern of our society today. It seems certain that in the coming decade substantially greater individual and community efforts to defend the quality of our environment will be necessary. Discoveries are continuously being made of new and previously unrecognized biological perils which may be threatening man's survival. The analogy to primitive man, with his dependence on an inhospitable environment, may become uncomfortably accurate.

Today our communications media seek to inform us of both our own "local" pollution problems and the compounding related environmental problems which face other areas around the globe. Governments at all levels are seeking more effective remedial and preventive programs in pollution control. Universities and research institutions are mounting research programs on pollution. Individuals and private groups are taking the initiative in the area of environmental protection.

In future, the continuing emphasis by governments will have to be placed on education, research and the application of appropriate measures to control pollution in all its forms. The challenges of environmental protection in Ontario illustrate the complexity of biological and economic influences on our environment.

THE PROBLEM

Environmental pollution is the condition of undesirable ecological change in the biological and aesthetic qualities of the air, water, soil and space around us. Changes in quality are occurring in such quantities and at such a rapid rate that neither neutralization nor accommodation by man and his beneficial biological associates is possible. The combined assault is producing a degradation of our environment which may become irreversible.

Today, pollution is caused by radioactivity, thermal, chemical and sonic conditions and material wastes including gases and refuse. These agents act on and in the mediums of soil, water and air — our surrounding land-

scape — and on its biological components, the combination of which makes up the environmental system of which we are a part. Pollutants produce conditions which tend to be physically damaging to the entire biosphere, including humans, and also tend to be aesthetically unpleasant.

TECHNICAL FACTORS

Water Pollution

The use of water bodies for the "natural assimilation of treated effluents in a properly controlled fashion" is recognized as a reasonable use, provided other beneficial uses are not adversely affected.²

The accumulation of undissipated or unneutralized wastes and their by-products in a body of water leads to pollution. The usual standards for measuring water quality include dissolved oxygen content, bacterial count, temperature, content of dissolved materials (toxic and nutrient), turbidity and chemical characteristics. There are also the important aesthetic considerations relating to appearance, smell and capacity for game fish. The precise definition of these standards is dependent upon the uses to be made of any water body.

There are three principal sources of water pollution in Ontario: municipal, industrial and agricultural wastes. Agricultural sources include animal wastes, eroded soil and the residues and run-off of fertilizers and pesticides. Controls are being developed in Ontario for most of these sources of agricultural pollution. The use of DDT and similar long-life insecticides was prohibited in 1969. The treatment of animal wastes is under study. Pollution from agricultural sources is generally less significant in terms of magnitude than are the other sources of water pollution in Ontario. However, the long-run effects of insecticide residues on a global scale may indeed be the most critical.

In terms of the organic waste load, municipal or household wastes represent only one-third of the volume of our industrial wastes. The majority of Ontario householders are connected to local sewer systems. These systems normally provide primary and secondary sewage treatment, which removes 85 per cent of the biological oxygen demand.³ This degree of control has been achieved through the expenditure of \$1,211 million for municipal sewers and treatment facilities since 1957. It is estimated that a 95 per cent treatment level is the outside limit of present

technology and would "triple or quadruple operating costs".⁴

Sewage Works Expenditures in Selected Years in Ontario

\$ millions

1957	80.1
1962	144.7
1967	151.5
1969	182.5
1970 ¹	170.0
Projection ²	700.0

Source: Ontario Water Resources Commission
¹estimate

²total expansions and improvements currently planned or forecast

Problems still to be solved include the damaging effects of detergent phosphates on water bodies and the pollution of our recreational waters by the cottages which surround them.

Industrial wastes, often carried by our municipal sewage systems, are now the major source of water pollution. Waste discharges from Ontario's pulp and paper, mining and metallurgical, steel, food processing, petroleum and chemical industries are large sources of suspended solids, oxygen consumption and the chemical degradation of water.

Industries have themselves taken steps to deal with the problem. Since the establishment of the Ontario Water Resources Commission in 1957, \$143 million has been spent on facilities for the collection, treatment and disposal of industrial wastes. It is estimated that an additional \$150 to \$200 million for capital expenditures by industry is still required. In future, expenditures for pollution control equipment will become an integral part of all new industrial establishments, rather than being as they are now, a complex and costly addition to a plant's production technique.

A new and expanding source of pollution is the thermal electric generating station. These plants discharge cooling waters at temperatures sufficiently above those of the recipient water body to affect the aquatic environment. The concept of thermal pollution is new and, as yet, little understood. Research into the harmful and beneficial

¹Province of Ontario, *Speech From the Throne, at the opening of the Third Session, Twenty-eighth Parliament, February 24, 1970.*

²The OWRC Regulatory Control Program for the Pulp and Paper Industry by H. A. Clarke and E. W. C. Turner, *Fifth Paper Industry Conference on Air and Stream Improvement, Toronto 1969.*

³The amount of dissolved oxygen used in the natural aerobic decomposition of a quantity of organic waste in a body of water.

⁴Toward a Social Report. U.S. Department of Health, Education and Welfare, 1969.

Estimated Capital Expenditures by Major Industries for Industrial Waste Treatment, 1957-69

Industry Classification	Total Expenditures 1957 to 1969 Inclusive \$ thousands
Pulp & Paper	41,733
Mining & Metallurgical	27,473
Petroleum & Petrochemical	25,911
Basic Iron & Steel	15,691
Chemicals	12,609
Metal Working & Plating	8,865
Other	10,335
TOTAL	142,617

The foregoing does not include money spent for pretreatment of industrial wastes prior to discharge to municipal facilities, or expenditure by industry in jointly financed industrial-municipal treatment works.

From 1965, expenditures have been computed from Commission certificates of approval and Division concurrences.

Prior to 1965, expenditures were compiled from data provided by industry.

Source: Ontario Water Resources Commission.

influences of thermal power stations is continuing in Canada and the United States.

Air Pollution

Air pollution is primarily a product of the combustion of fossil fuels. In the U.S., the operation of motor vehicles is the source of at least 50 per cent of all major air pollutants. Industrial sources account for approximately 18 per cent, while utilities and other energy conversion activities contribute 21 per cent. The usual classification is between mobile and stationary sources of pollution.

Air borne pollutants include: carbon monoxide the most important pollutant in terms of weight emitted into the atmosphere; oxides of nitrogen and hydrocarbons, elements which produce photochemical smog; sulfur dioxide, released by the burning of coal and oil; and particulate matter such as industrial ash and lead from auto exhausts.

Development of atmospheric quality goals or standards is still in its primary stage because of the lack of comprehensive scientific data. However, it is known that air pollution can cause physical damages such as corrosion and soiling; can contribute to sickness and disability; and can injure agricultural crops

and other vegetation. The severity of the effects depends on the concentration and duration of the pollutants in the atmosphere and the frequency with which exposure occurs. Concerning long-term effects, "the more distant future holds the ominous possibility of radical changes in climatic conditions".⁵

The total cost factor in air management programs for Ontario is currently unknown. It has been estimated by the Air Management Branch of the Department of Energy and Resources Management that the cost of preventing air pollution from the province's pulp mills alone will be approximately \$50 million. Restrictions on the maximum sulphur content of heavy fuel oils and coal used in Ontario will, if imposed, add to the private users' operating costs.

In the case of automobiles, present regulations to reduce gasoline evaporation and exhaust pollution emissions cost approximately \$6 to \$7 million in the current model year. If stiffer standards are found to be necessary, costs could increase from \$20 per vehicle to over \$100 per vehicle. The motor vehicle industry itself has announced plans to produce vehicles which will use unleaded gasoline. In a message to Congress, U.S. President Richard Nixon has stated that, "it is quite possible that by 1980 the increase in the sheer number of cars in densely populated areas will begin outrunning the technological limits of our capacity to reduce pollution from the internal combustion engine".⁶

Pollution of the Land: Soil and Landscape

This form of pollution results from a variety of sources; pesticide residues in the soil, solid wastes including radioactive materials, and the degradation of landscape quality and scenic value. The harmful elements of noise, the poor quality of community planning and land use zoning and even the loss of outdoor recreational resources may be considered as part of this extensive type of pollution. Some aspects are now coming to be recognized as current or potential environmental problems. As yet little research has been done on such factors as noise pollution.

Solid wastes are increasing, both in variety and in volume. The tonnage of solid wastes for disposal in the U.S. is projected to increase 166 per cent in the period from 1966 to 1976. Ontario's solid wastes will probably grow as fast. In the past, the main constituents of solid wastes were organic; now our accoutrements of living and of refuse include

cans from durable alloys, glass bottles, "indestructible" plastic containers and packaging, scrapped cars and appliances, industrial wastes . . . ad nauseum.⁷ In many instances, the accumulation of solid wastes is exhausting convenient land-fill sites in our urban areas. Pollution of the ground water systems is also present in land fill operation. Similarly, incineration of the wastes can contribute to air pollution.

The waste management programs to be undertaken by the U.S. government are directed toward two major goals which would be appropriate for Ontario:

- 1) Making products more easily disposable — especially containers, which are designed for disposal.
- 2) Re-using and recycling a far greater proportion of waste materials. In the long-range future recycling of materials will become increasingly necessary not only for waste disposal but also to conserve resources.⁸

Air pollution was brought under provincial jurisdiction in 1967. It is now expected that in the near future the provincial government will assume responsibility for the control of waste disposal in Ontario. The program might regulate the number and location of private waste dumps and control the types of waste which could be disposed of in various classes of dumps.

The annual costs of solid wastes treatment in Ontario are currently running at \$90 million. These expenditures are estimated to climb to \$250 million by 1980. More than 50 per cent of the expenditures will be made for the disposal of industrial wastes. In terms of individual consumption and waste production, a possible financing technique would be to include in the price of an object the cost of its eventual disposal by the community.

How are we to deal with the waste products of all our activities; industry, commerce, agriculture and domestic living? In the past, economic theory has tended to be concerned with services yielding utilities, not with physical substances. The "final consumption" of our manufactured products does not in fact reduce the size of the residual load on the environment. The physical concept of a "materials flow" and the law of conservation of matter must be recognized. The amount of output deposited in the natural environment must equal the amount of fuels, food and other raw materials that enter the processing systems. While most of the waste products can still be assimilated with little

⁵Ibid.

⁶Message by President Richard Nixon to the Congress of the United States of America, on a Comprehensive Pollution Program, February 10, 1970.

⁷A representative of the plastics industry has forecast that plastic refuse in Canada will increase from 300 million pounds in 1966 to 600 million pounds by 1975.

⁸President Richard M. Nixon: op.cit

damage to our environment, the remainder is causing concern.⁹

The accompanying chart shows the physical flow of materials in our system – from primary products through energy conversion and materials processing to final consumption, waste production and residuals processing. Each stage in the cycle results in the escape of by-products and residuals into the environment. The diversity of both the sources and types of waste products is illustrated by the numerous outward flows from the processing and consumption stages. Our objective is to achieve in the future a greater return of the outward flows to the processing-consumption system, as useful raw materials and recoverable or recycled resources, with fewer residuals released to damage the environment.

ECONOMIC FACTORS

The complex phenomenon of pollution extends far beyond local jurisdictions in terms of both cause and effect. The problems of pollu-

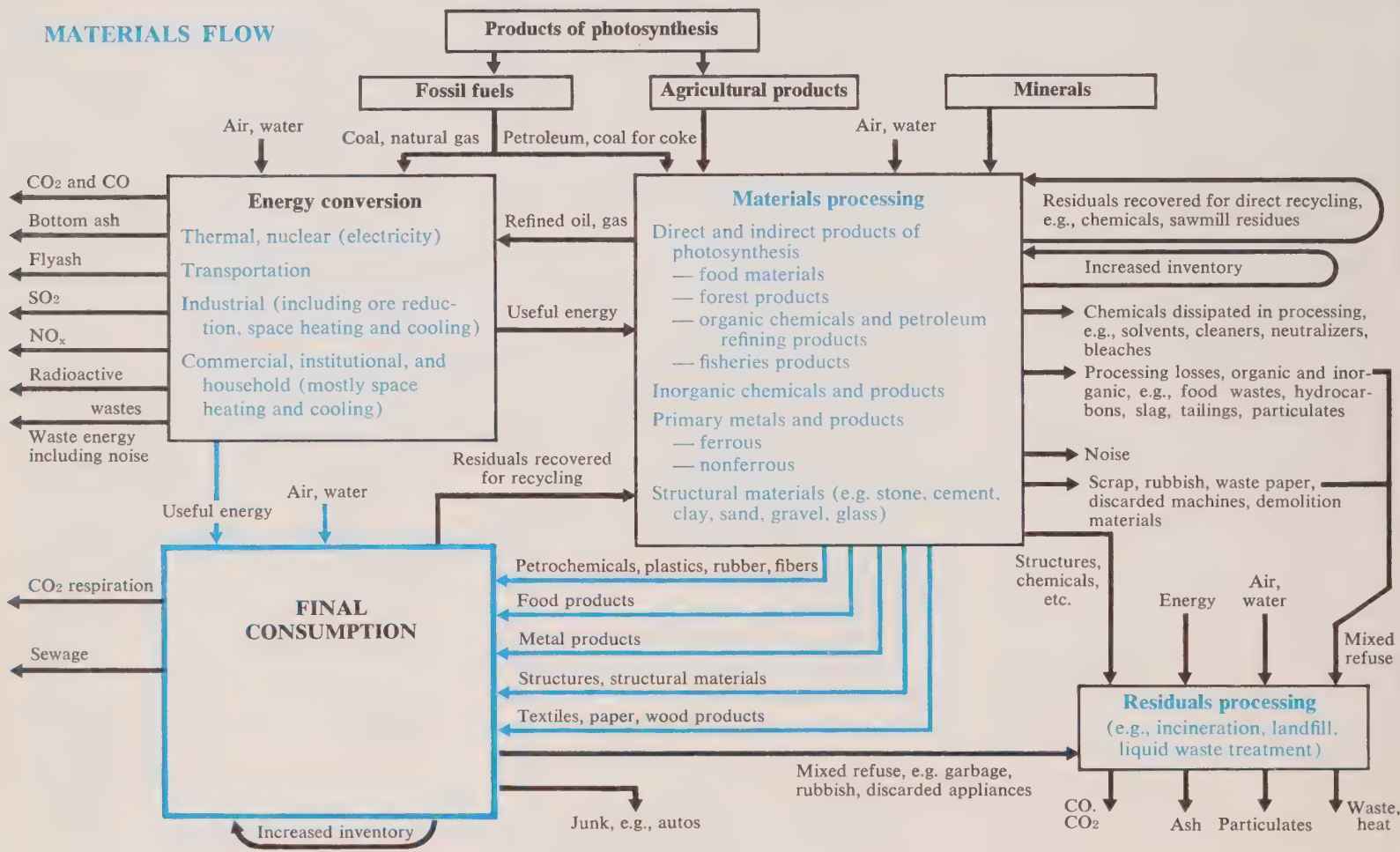
tion are now being recognized throughout Canada and indeed, throughout all advanced industrial countries of the world.

Underlying Causes

The causes of pollution are intimately inter-related with the goals and activities of advanced societies. The rapid rate of physical progress and the growth of Ontario's population have contributed to our pollution problems. Demands for more new and better goods and services have increased the problem. Similarly, the concentration of population and industry in our major urban areas is a significant contributing factor to the deterioration of our environment. An increasing awareness of our surroundings and a growing demand for improved quality in all things have also served to emphasize the damages caused by pollution.

The desire for economic growth results jointly in greater affluence, and through the industrial sources of wealth, more effluents. Our demands for greater convenience, greater

processing and greater sterility in the goods we consume all include an element of pollution. In order to satisfy these demands, our economy generates new technologies resulting in new products, new materials, more packaging and concurrently, more wastes and new and difficult waste disposal problems. Fertilizers and pesticides which are used to help meet our agricultural requirements contribute to undesirable conditions in the soil and in the rivers and lakes. The search for convenient transportation techniques and recreational opportunities, may often be both self-defeating and damaging to the environment. The ubiquitous car is recognized as a significant contributor to noise and air pollution in urban areas. Snowmobiles, motorboats and aircraft can all have a negative effect on the outdoor environment. The list of contradictory situations – where social costs as well as individual or social benefits are incurred – in our society seems endless. The universal aspect of pollution as it is interwoven with the laudatory objectives of



Source: Resources for the Future, Inc. Annual Report, 1969

⁹See also Pervasive External Costs and the Response of Society, A. V. Kneese and R. C. d'Arge, Resources for the Future, Inc., 1969.

our society must not be overlooked when solutions are being sought.

A Public Good

The complex nature of environmental protection results in part from the fact that the environment is a public good — as opposed to a private good that is capable of divisibility and private ownership. Pollution caused by an individual damages the environment for all society while producing short-term private benefits to the polluter. The rest of society is not compensated for the damage that the polluting activity inflicts on the environment. The polluter's private costs are less than the full social costs of his action. The result of this discrepancy between the private and social costs is an excess, in economic welfare terms, of production by the polluter.

In the past, the individual has not always been held responsible for the social costs of his polluting actions. He, therefore, has had little incentive to reduce the damaging effect of his actions on the environment. "Quite inadvertently, by ignoring environmental costs we have given an economic advantage to the careless polluter over his more conscientious rival. While adopting laws prohibiting injury to person or property, we have freely allowed injury to our shared surroundings."¹⁰ Because of the public nature of the environment, governments must act for society both to eliminate injurious pollution conditions and to recover from the individual polluter adequate compensation to cover the social costs of his damage to the environment.

There is however, a separate problem inherent in the allocation of social costs. The cause and effect relationship between an individual activity and its increment to environmental pollution levels and social costs is often remote and not easily observed or evaluated. In most cases each separate act of pollution by an individual or an industrial establishment causes an imperceptible increase in environmental degradation. Only when the minute changes from many individual activities accumulate does the damage become observable. At this point it is extremely difficult to determine the portion of the total social costs attributable to each individual pollution source. Therefore, in lieu of effective measurement techniques for the resulting social costs of environmental pollution, the treatment costs of pollution, expressed in monetary terms, must be substituted.

Treatment costs in Ontario in the field of

water pollution control alone have reached in excess of \$1.3 billion since 1957. Public and private expenditures in 1969 for comprehensive water management and pollution control programs were approximately one quarter of a billion dollars, including \$200 million spent by the municipalities for water supply and sewage treatment facilities. Private capital expenditures of \$15 million for industrial waste treatment facilities are also included in the 1969 total. To date, the direct treatment costs for solid wastes and air pollution control are of a substantially lower order. However, future expenditures in these areas are expected to grow particularly rapidly.

Economies of Scale

In some cases economies of scale in treatment programs can be achieved where a multitude of individual polluters are contributing to environmental damage. It is much more efficient in water treatment, sewage or waste management programs to install community facilities rather than requiring each polluter to conduct his own separate program.

The concept of scale forms the basis for the large public water supply and sewage treatment schemes being developed in Ontario. Twenty-five regional schemes were under active development at the end of 1969. In 1968, the largest scheme to date involved the OWRC and five Peel County municipalities. The objective is to develop an extensive water supply and sewage system at a cost of \$88 million over the next twenty years. Ownership of the provincially financed schemes remains vested with the province. The participating municipalities pay for the water supply and sewage treatment services based on the actual cost to the provincial government.

Externalities

There are some additional economic considerations related to the public nature of our environment. Due to the complex nature of different components in the environment, both pollution acts and control activities have external implications beyond local jurisdictional boundaries. Thus, either damages or benefits can occur as "spill-overs" to communities beyond the local area where the polluting act or control activity occurs.

At the local level, a farm's well water may become degraded as a result of ground-water pollution resulting from neighbouring activities. The "spill-over" problem can arise unexpectedly from industrial or sanitary land

fill projects which pollute local ground-water supplies, as well as from salts and petroleum products which enter a ground water system. Investigation and control of ground-water pollution is a responsibility of the Division of Water Resources of the OWRC.

A similar externality arises when unpleasant odours from an agricultural operation cause discomfort to neighbouring residents. A code regarding air pollution and odour problems has been proposed by the Ontario government under the Ontario Air Pollution Control Act to provide guidelines for agricultural operations in proximity to residential areas.

In terms of benefit "spill-overs", a downstream user of a river will receive some benefits, in terms of reduced treatment costs or a larger and cleaner water supply, as a result of water management and pollution control programs of upstream municipalities.

The international nature of pollution control is exemplified by the current report by the International Joint Commission on pollution in Lakes Erie and Ontario and the international section of the St. Lawrence River.¹¹

The recommendations of the IJC include:

- 1) Adoption for these waters of water quality objectives appropriate to the area;
- 2) Acceleration as necessary of the pollution control program of the several state and provincial agencies concerned, in order to meet the recommended water quality objectives at the earliest possible dates;
- 3) Maintenance of adequate water quality surveillance and monitoring activities to allow for assessment of and adjustments to water pollution programs of enforcement, management, planning and research; and a continuing board to co-ordinate on an international basis, programs for water pollution control of the Great Lakes; and
- 4) A phosphorous control program effecting an immediate reduction in the phosphorous content of detergents to minimum practical levels, and by 1972, complete replacement of the phosphorous compounds by substitutes less harmful to the environment. An 80 per cent reduction of phosphorous complexes in municipal and industrial waste effluents discharged to Lake Erie and the Detroit River would be required by 1972, and a similar reduction in discharges to Lake Ontario by 1975.¹²

Following recent federal-provincial discussions, the Government of Canada is now

¹⁰President Richard M. Nixon: *op.cit*

¹¹The International Joint Commission is a joint U.S.-Canada governmental body set up 60 years ago to deal with problems affecting boundary issues of the two countries. *Investiga-*

tions into the international pollution problems of the Great Lakes and their connecting channels were carried out by the Ontario Water Resources Commission for the information of the IJC.

¹²As reported by the Federal government in Fisheries of Canada, November, 1969.

investigating the most effective means of achieving control within a reasonable timetable. It has been estimated that municipal water treatment costs would increase by 100 per cent, if the phosphate content of detergents were not reduced.¹³ The cost of additional phosphate removal equipment needed to reach the IJC objective could be \$40 million for Ontario communities on the Great Lakes.

Under the Canada Water Bill, the Federal government is currently developing a formal legislative statement of its future role in water management and pollution control in Canada. After receiving second reading early this year, the bill is now being amended following discussions with a number of provincial governments. Measures to control the level of phosphates reaching the Great Lakes will be implemented under this bill.

Again, the existence of externalities, particularly from water and air pollution by local communities, has made it necessary for the Government of Ontario to undertake responsibility for pollution control within the province. Ontario is able to internalize the spill-overs from the different communities within the province and to assign benefits and costs equitably among the entire population. Because of the existence of externalities beyond Ontario boundaries — environmental damages can and do occur as a result of activities taking place outside of provincial jurisdiction — there is a role for the Federal government within its constitutional jurisdiction in inter-provincial and international situations concerning pollution acts which affect the Ontario environment.

ESTABLISHMENT OF PLANNING OBJECTIVES

A first step toward the solution to the complex problems facing our environment is the establishment of planning objectives. The objective must be to establish a dynamic and flexible system which will protect the quality of our environment against ever-changing pollution threats. The three inter-dependent components of such a system are control, prevention and improvement.

As an immediate objective, the current levels and types of pollution should not increase in intensity despite our growing economy. This is the control element of the system. The specific pollution problems which we can recognize today, must be brought under control and held to acceptable levels by such methods as exhaust reduction

devices on all new autos sold in Ontario, sewage holding tanks on pleasure craft, or very recently, the promised federal commitment to effect a reduction in phosphate content of detergents.

Concurrently, we must also seek effective measures to prevent new and different forms of pollution damage. For example, we might have recognized more fully and more quickly the potential for environmental damage inherent in the increasing use of DDT, or less critically, in the introduction of non-returnable glass bottles, and avoided some of the damages. Some pollution problems are more effectively overcome by avoidance and prevention rather than treatment after the damage is done. Environmental specialists suggest that the introduction of the new jumbo and supersonic jets, with their attendant exhaust and noise problems, will lead to a situation where some form of preventive action is required.

In future, the primary emphasis in our environmental quality system will have to be placed on prevention. In terms of economic efficiency and human survival, the recognition and prevention of potentially disastrous damages to the environment must be consistently sought by all governments. Similarly, the private sector will have to investigate more carefully the environmental side-effects of each new product and process.

The third component of an environmental defence system is improvement. The objective is more than simply maintenance of the present environmental quality. We can move forward with programs to improve our whole environment. The control of pollution and prevention of new damages must, in the longer run, be supplemented by a dedication to bring all forms of pollution to irreducible minimums through the best use of our physical resources.

In striving for these objectives for the environment, the constraints imposed by our economy cannot be overlooked. Ontario has, in both the public and private sectors, a limited amount of funds for carrying out all its responsibilities, including pollution control programs. Within the constraints of our economic capabilities, Ontario's various objectives must each be furthered as much as possible. Conflicts can occur between objectives, as they do between the proponents of ultimate environmental quality at all costs versus those who seek economic growth at all costs. Government must determine the trade-offs which are necessary between conflicting

goals, giving due regard to the social benefits and costs of each activity. If Ontario has achieved a greater expertise in pollution control than other areas in Canada, it reflects both greater economic capabilities to deal with the problem and, as a by-product of our economy, greater pollution problems.

GUIDELINES FOR PUBLIC POLICY

There are several basic guidelines about which policies for environmental quality can be built. Two of the guidelines relate to long-term objectives for Ontario. The fundamental principle of efficient use of our physical resources, in the sense of a broad ecological system, must result in minimizing waste and unusable products in our environment. Associated with this principle is the recognition of our environment as a resource. The concept of a closed system — "the spaceship earth" — will minimize pollution and environmental damage while maximizing the utility of all our resources. The previous objective of prevention of new pollutions is an expression of this guideline.

A second basic principle for the long-term is the minimum use of the natural environment for waste dispersal or disposal. While this principle must be recognized as only a theoretical concept in the light of present technology, it can serve as a guide for the continuing improvement of pollution control activities. Thus, a city's sewage and water treatment facilities would serve as much as possible as a closed system — not, in fact, utilizing more than necessary the neighbouring river or lake as part of the local purification system. Similarly, the atmosphere would not be considered as an extension of the factory's smoke stack.

There are two economic guidelines which must shape all pollution control policies: user and polluter charges. All users of the components of the public environment — atmosphere, soil, water and the landscape — must pay the unassigned public costs of quality control, just as each community must bear the social costs incurred in its own environmental degradation. These costs for clean water and clean air must be borne through public tax levies by all the individuals living in and benefiting from their protected environment. Conversely, outside jurisdictions which do not derive benefits through spill-over effects cannot be assigned, on economic grounds, a share of the costs.

The second economic guideline is that the polluter must bear either the cost of pollution

¹³Testimony to the IJC on February 21, 1970 by the sewage disposal commissioner of Toledo, Ohio.

abatement expenditures incurred to maintain environmental quality or compensate fully for the cost of the resulting damage.¹⁴ The actual damage to the environment represents social losses which often cannot be accurately defined in monetary terms. Financial penalties must be used as a surrogate for these unknown social losses. Penalties also encourage the polluter to reconsider the economics of his own polluting activities.

ROLE OF GOVERNMENT

The responsibilities of government in pollution control are two-fold: to ensure the protection of the environment as a critically limited public resource; and to inform and educate the individual to recognize his responsibility and his own vital interest in pollution abatement. Governments can also offer advice and assistance to the individual in the complex and costly area of pollution control.

Governments must also undertake systematic planning on a comprehensive, inter-jurisdictional basis in order to protect our environment. Public objectives must be clarified and effective programs devised, financed, and implemented. Minimum and desirable quality standards for air, water and the landscape are required. The degree of deviation from these standards permits the assignment of priorities. Program priorities can be set within the parameters of general environmental objectives, regional and local objectives and individual problem situations. Continuous monitoring and quality assessment are necessary in order to achieve the desired quality standards. Governments must ensure an equitable distribution of costs of pollution control measures based upon the public and private share of all benefits and all costs. Another extremely significant role of government is that of research. An expanded program of research into the current and predictable pollution problems affecting the environment and into a search for solutions to these problems is urgently needed on a national and international scale.

The provincial government has the broad responsibility for pollution control and environmental defence within its own jurisdiction. Ontario has on-going programs in the areas of research, solid wastes management, comprehensive water resource management, atmospheric pollution control, restrictions on chemical pollutants such as DDT, and other environmental health concerns.

The Department of Energy and Resources

Management is primarily responsible for our program of environmental management and pollution abatement. That department contains: the *Advisory Committee on Pollution Control*, the senior advisory body on pollution; the *Air Management Branch* concerned with maintenance of urban air quality and abatement of air pollution; the *Waste Management Branch*, providing assistance to municipalities on the technical problems of solid waste disposal; and the *Conservation Authorities Branch*, concerned with conservation and comprehensive environmental management on a river valley basis, through local municipal governments. This latter program includes water management and flood control projects. The program of the agency was initiated in 1946 with the passing of the Conservation Authorities Act.

The Minister of Energy and Resources Management, the Hon. G. A. Kerr, also has reporting to him the *Ontario Water Resources Commission*, whose primary concern is the control of water pollution, the provision of adequate supplies of water and the supervision of all surface and ground-waters throughout Ontario. The Commission has established water quality guidelines for Ontario waters.

Formed in 1956, the functions of the OWRC include: inventories of water resources, monitoring of water quality, approval of plans of water and waste treatment projects, inspection of facilities, investigation of sources of pollution, financial and other assistance for the construction and operation of water and sewage plants in municipalities, biological, bacteriological and chemical studies, and public information. Control of pollution by pleasure boats is another responsibility of the Commission.

The *Environmental Health Services Branch* of the Department of Health is also concerned with aspects of environmental protection. The *Pesticides Advisory Board* serves all departments concerned with pesticides.¹⁵ As noted previously, the general use of certain pesticides, including DDT, was banned in Ontario in 1969.

The government of Canada also has a role to fulfil in environmental quality control. There is an opportunity for the Federal government to participate with the provinces in offsetting some of the public costs of pollution control. There is also a requirement for expanded federal financial encouragement to the private sector to undertake pollution abatement measures. Inter-government co-

operation is necessary in respect of joint programs involving tax abatements, grants, loans or other incentives.

Extensive federal involvement is needed in environmental research in conjunction with research programs in Ontario. The research requirement is both substantial in size and international in scope. The federal research program could concentrate on longer term research projects and advance warning systems to identify and avoid potential environmental dangers.

There is a third general area in which a federal commitment is appropriate. Inter-jurisdictional and regional environmental problems merit federal participation within its constitutional jurisdiction. As water pollution is a widespread current problem, remedial programs at the national as well as provincial levels will be useful. The proposed Canada Water Act can provide a vehicle for federal participation in the establishment of common water quality criteria and in international situations.

It must be ensured that no agency or region employs unrealistically low environmental quality standards which will result in damaging "spill-overs" or which will create an undue advantage over other jurisdictions for the attraction of industry.

CONCLUSION

Environmental pollution is a dynamic problem with ever-changing parameters. In order to protect the quality of our environment — to manage the environment effectively — continuing investigation is required into different approaches and techniques. New and improved institutional and interjurisdictional arrangements must continue to be sought. All levels of government must also ensure that the problems of fragmented responsibility for our environment are not further compounded through duplication of effort and bureaucratic complexity. Co-ordinated and comprehensive planning is essential.

Further analysis of environmental questions in terms of public goods and social welfare concepts are needed. The problems of equitably allocating the costs of environmental protection between individuals, industries and the public sector are not yet solved. It is also necessary that we fully realize that our commonly held objective of maximizing economic growth holds unpleasant implications for the quality of the environment and indirectly, for ourselves.

¹⁴See also *Pollution, Property and Prices*, J. D. Dales, University of Toronto Press, 1968.

¹⁵These services are expected to be transferred to the Department of Energy and Resources Management in the near future.

Selected Economic Indicators

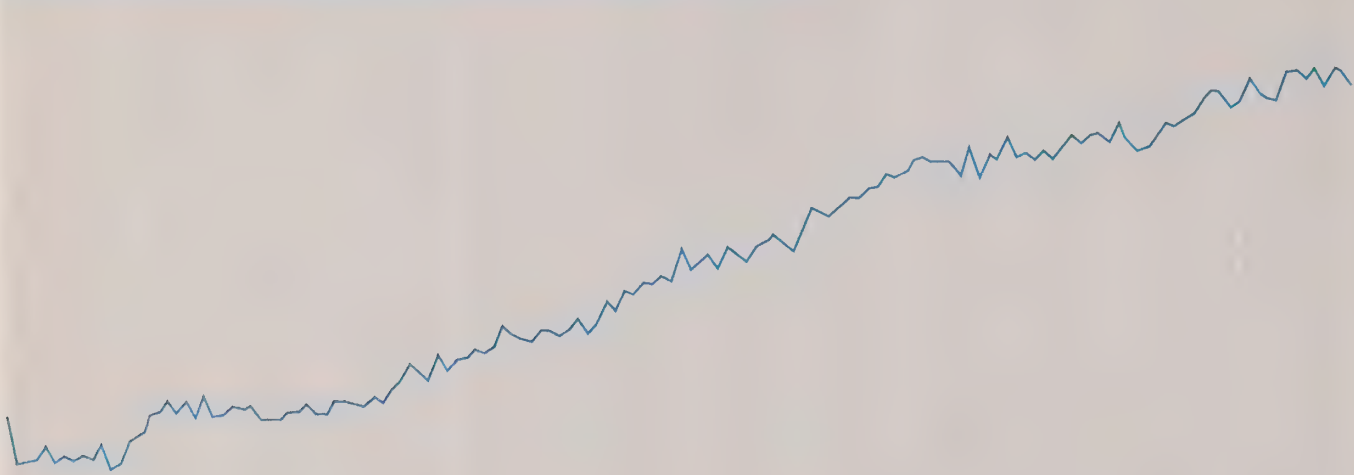
Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



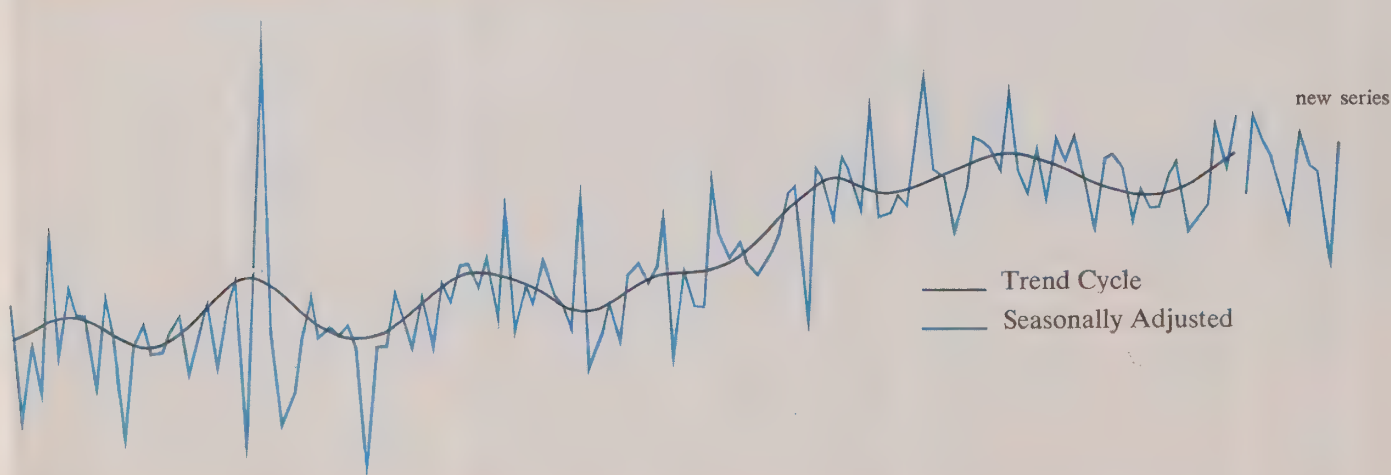
Scale A
Number
_42
_41
_40
_39

New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



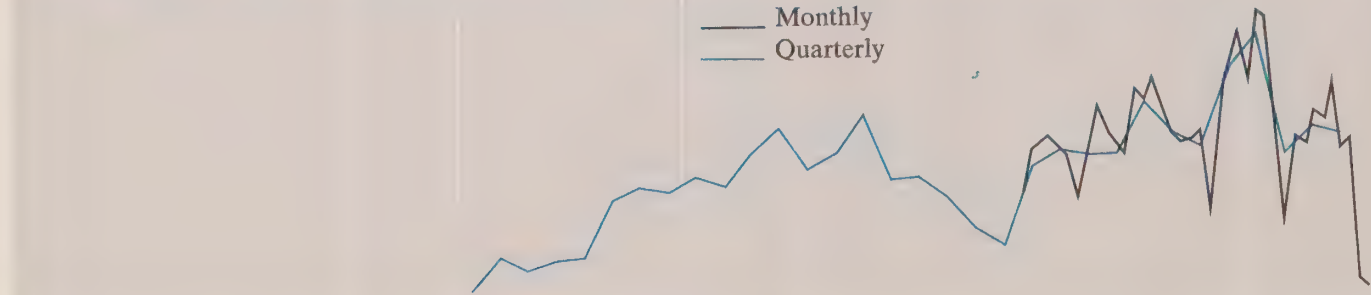
Scale L1
\$ Billion
_4.0
_3.5
_3.0
_2.5
_2.0

Commercial/Institutional and Industrial Construction Contracts, Ontario



Scale L2
\$ Million
_200
_160
_120
_100
_80
_60
_40

Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Scale L2
Thousand
_100
_90
_80
_70
_60
_50
_40

1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970

Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

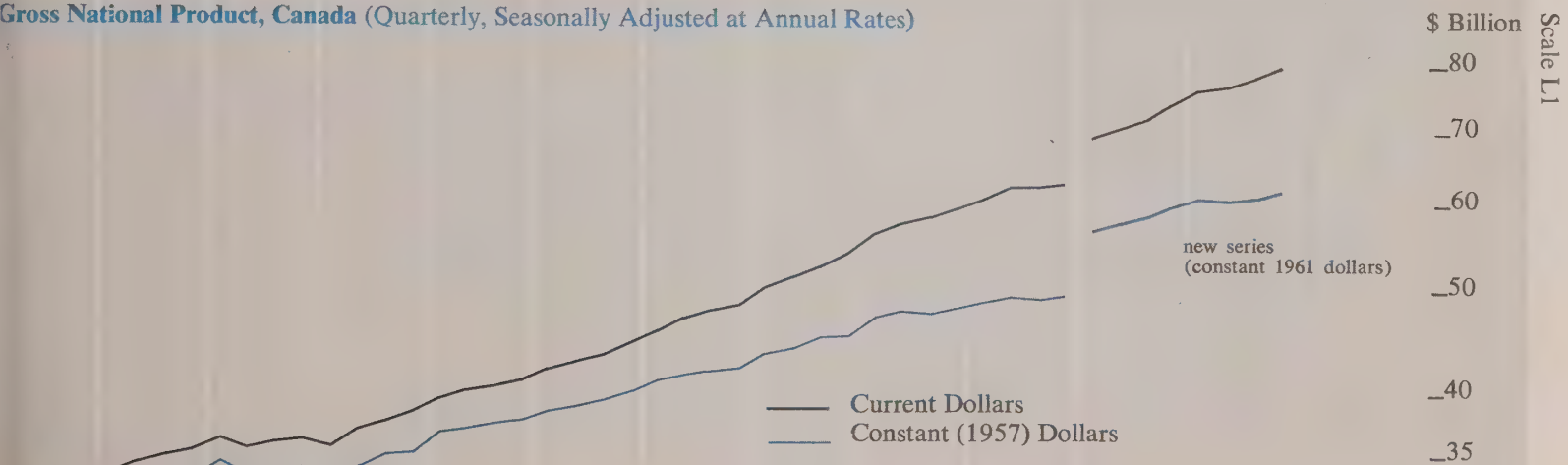


Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

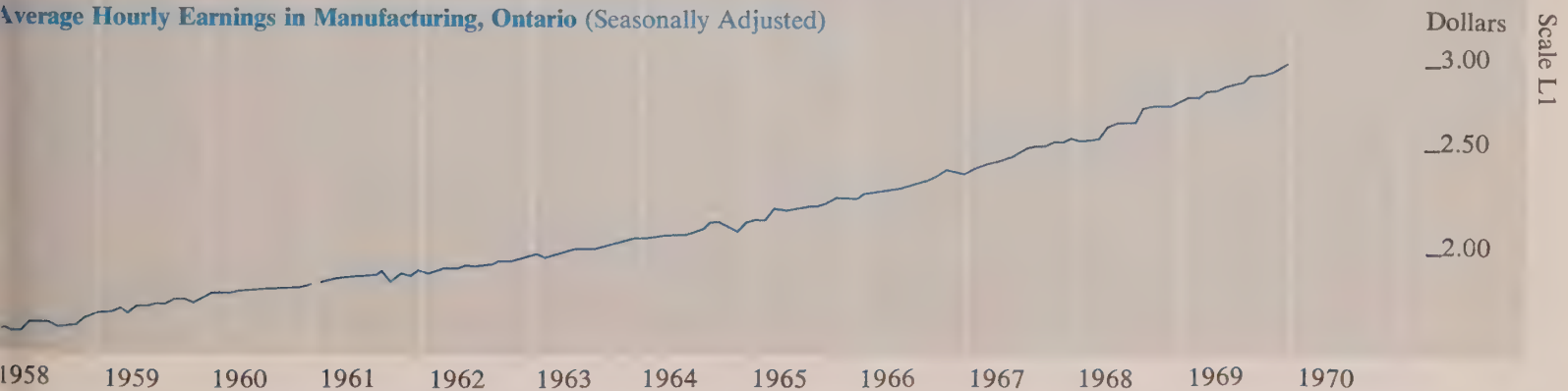


Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)



Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



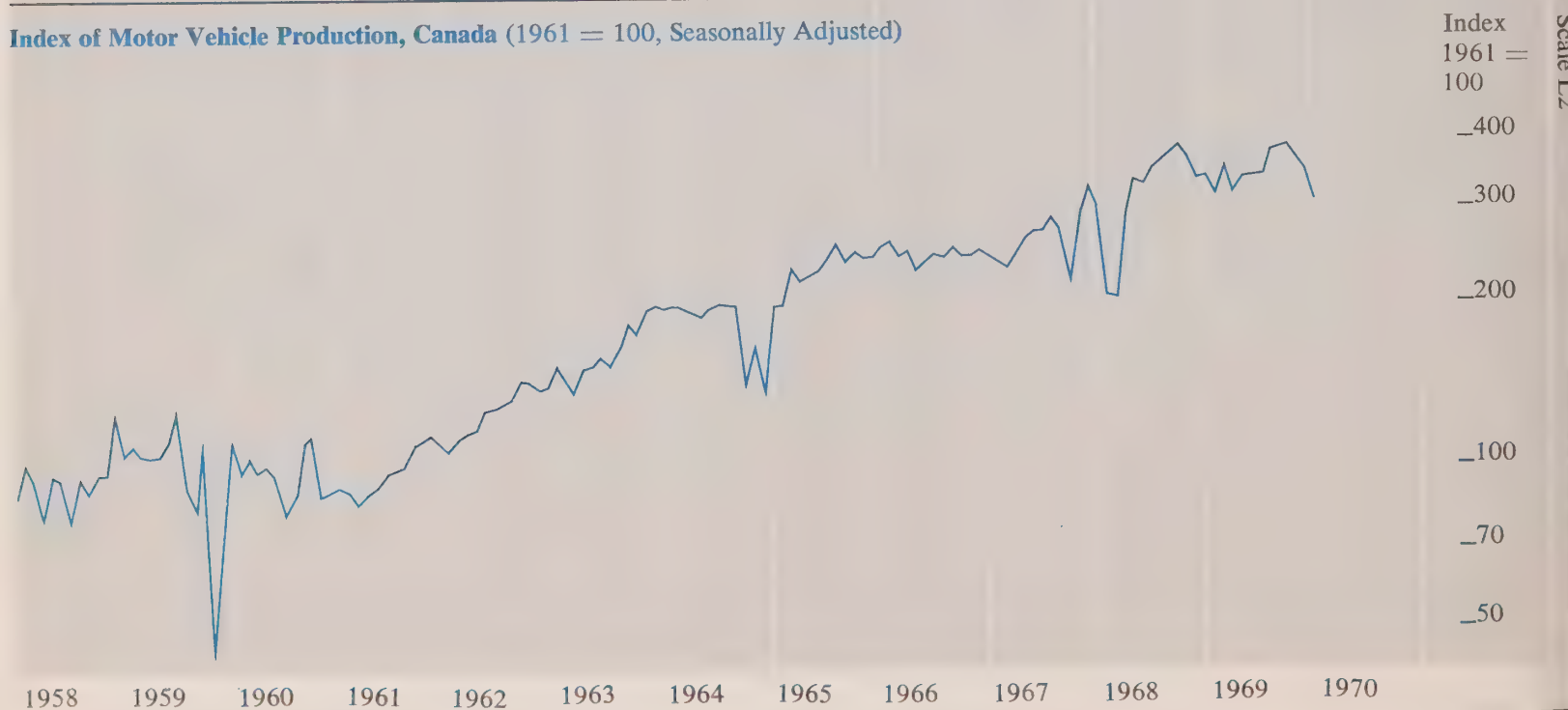
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)



Economic Indicators

Seasonally Adjusted

	1969												1970	
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Leading Indicators														
Average Weekly Hours Worked in Manufacturing	40.5	40.4	40.5	40.1	40.4	40.1	40.2	39.6	40.3	39.9	39.9	38.4		
New Orders in Manufacturing Industries ^c	3,518	3,693	3,575	3,539	3,564	3,743	3,741	3,690	3,770	3,634	3,754	3,728	3,609	
Commercial/Institutional and Industrial Construction Contracts	111.9	157.9	140.6	126.1	112.8	93.9	144.0	127.0	123.2	86.6	137.3			
Urban Housing Starts (Annual Rate)	80,800	109,700	102,400	79,900	45,300	63,900	60,800	69,300	67,300	78,300	59,100	64,700	36,600	34,800
Money Supply ^c	27,669	27,927	28,251	28,331	28,336	28,638	28,324	28,292	28,403	28,472	28,580	27,718	27,692	
T.S.E. Industrial Index ^u	192.47	185.20	190.58	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37	177.89	183.92
Business Failures ^u	57	59	55	58	48	35	32	51	52	64	54	53	56	71
Business Failures — Liabilities ^u	2.9	3.2	2.2	3.2	1.9	2.0	0.9	2.6	4.8	3.4	4.6	2.2	9.9	18.7
Coincidental and Lagging Indicators														
Gross National Product ^c (Annual Rate)			76,492			76,968			78,684				80,252	
Unclassified Indicators														
Foreign Exchange Reserves ^{c,u}	2,864	2,820	2,779	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	2,616	2,798	
Industrial Materials Price Index ^{c,u}	261.4	263.5	264.1	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5	272.3	274.3
Consumer Price Index ^{c,u}	122.6	122.6	123.2	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9	128.2	128.7

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.





Ontario Economic Review

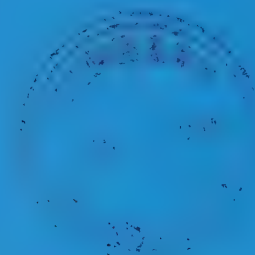
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May/June 1970
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Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister



Ontario Economic Review

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Volume 8, Number 3

The Ontario Economy

The Public Sector and Economic Policy

Taxation and Fiscal Policy Branch,
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

About the Review

The feature article for the May-June edition of the *Ontario Economic Review* is based on Budget Paper A, The Public Sector and Economic Policy, contained in the 1970 Annual Budget Statement of the Hon. Charles MacNaughton, Treasurer of Ontario and Minister of Economics.

The article is presented by the Ontario Government as a first step toward stimulating a broader and more intensive inquiry into the theory and practice of economic policy co-ordination in the Canadian federal system. Specifically, the article concentrates on the question of the formation of public policies to reduce inflation and to achieve full employment growth and balanced development of the public and private sectors of Canada's diversified economy. The Ontario Government questions the effectiveness of present federal programs to control inflation and suggests that economic growth will be sacrificed if governments continue to apply severe monetary and fiscal restraints.

The article was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Policy Planning Division of the Department of Treasury and Economics.

Indicator Charts, Pages 9-11

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 9-11 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



Private and Public Investment — 1970

New private and public capital spending in Ontario is expected to increase approximately 14.0 per cent this year to \$7.1 billion, with spending on housing the only weak spot according to the federal Department of Industry, Trade and Commerce. Actual spending on housing is expected to decrease by 10.7 per cent to \$1,275.4 million in 1970.

Increasing strongly in spite of federal efforts to curb the pace of the Ontario economy, it is anticipated that capital investment will advance at nearly double the national rate. Construction in trade, finance and commercial services is expected to increase by approximately 55.0 per cent this year despite federal budgetary intentions to discourage commercial construction in Ontario urban centres by extending the deferral of depreciation allowances into 1970. Commercial construction alone should amount to \$451.8 million compared with \$291.1 million in 1969.

Estimated total capital expenditures in Ontario for 1970 are shown in the table below.

The survey finds the greatest strength in manufacturing industries, where a 41.1 per cent increase in capital spending to \$1,762.0 million is anticipated. In 1969 capital expenditures in this category rose 24.8 per cent. At the national level capital outlays in manufacturing industries are expected to increase by 24.0 per cent to \$3,154 million following a 15.7 per cent increase last year. Since the major goods-producing industries are largely concentrated in Ontario it is not surprising that this province is expected to outperform the national average in the manufacturing sector. In addition, many of the investment intentions of 1969, unrealized due to strikes

and tight monetary constraints, have been carried forward to 1970, hence a somewhat higher growth rate is expected in business investment. Intended outlays are particularly high in the primary metal, machinery, transportation equipment, paper and allied products and petroleum and coal products industries.

It is anticipated that the marked industrial expansion forecast by the report will improve productivity and manufacturing efficiency and thus provide some relief to rising production costs. In addition, the expansion should also offset to some extent the adverse effects on employment of a general deceleration of economic activities visible in the second quarter of 1970.

At the national level private and public sectors are expected to spend \$17,865 million for fixed assets in 1970, \$1.25 billion or 7.5 per cent in excess of actual expenditures in 1969. The annual capital spending intentions outlook, based on surveys carried out late in 1969 and early in 1970, indicates the overall rate of increase will be about the same as in 1969, however it will represent a rising level of activity in terms of volume. These increases follow two years when capital outlays rose only marginally in terms of value and in which the volume of such activity actually declined.

Outlays for new construction in Canada are expected to rise 7.0 per cent to \$11.44 billion while outlays for new machinery and equipment are expected to rise just over 8.0 per cent to \$6.43 billion. Including repair expenditures, total private and public outlays on construction, machinery and equipment are expected to total \$23.3 billion this year. As in Ontario, the main impetus behind capital spending growth this year will

come from the business sector which is expected to increase expenditures 11.0 per cent to \$10.9 billion. This is a reduction from the 14.0 per cent increase indicated by the preliminary survey last fall of 150 large companies.

Spending on new housing and social capital spending by governments and institutions will reach \$6.9 billion. However, while government and institutional expenditure is expected to increase by approximately 10.0 per cent to \$3.7 billion, spending on housing will decline 5.0 per cent to \$3.2 billion. Most of the decline in housing outlays — \$153 million of the \$170 million decrease — will take place in Ontario. High land costs, especially in the large urban centres plus high interest rates and a limited supply of private funds are expected to continue to hold down demand for single family dwellings. It is anticipated that starts for the first half of 1970 will be lower than in the corresponding period in 1969, but there should be a reversal of this trend in the latter half of the year, with the result that the number of starts in Ontario will again reach the 80,000 level.

The report states that the program, if realized, will provide moderate growth impetus to the economy without placing excessive demands on investment-supporting activities.

Employment: January to March — 1970

Slow growth of the Canadian economy has sharply curbed expansion of the labour force. In the first quarter this year, the labour force averaged 8,027,000 persons, just 120,000 higher than a year earlier. The increase of 1.5 per cent compares with an annual increase of 2.9 per cent in 1969 and an unusually large year-to-year increase of 4.2 per cent in the first quarter of 1969.

Unemployment in Canada, at 542,000 or 6.7 per cent of the labour force in March 1970 reached its highest point since March 1963. Ontario, with an unemployment rate of 4.6 per cent is, in relative terms, less seriously affected than other regions. However, with 144,000 unemployed the province is experiencing its highest jobless rate since March, 1962. The 42.4 per cent increase in unemployment in Ontario, from 99,000 to 141,000 over the period March 1969 to March 1970 is higher than the percentage increase in any other region except the Prairies where an increase of 43.7 per cent occurred over the same time period. The

Estimated Capital Expenditures, Ontario, 1970

Sectors	1970	1969	Per Cent Change
	\$ millions		
Housing	1,275.4	1,429.0	-10.7
Primary Industries	548.1	512.8	6.9
Manufacturing	1,762.0	1,248.6	41.1
Utilities	1,342.6	1,175.0	14.3
Trade, Finance and Commercial Services	899.5	673.2	33.6
Institutional Services and Government	1,268.8	1,199.3	5.8
Total	7,096.4	6,237.9	13.8

Source: DBS, *Private and Public Investment in Canada — Outlook 1970 and Regional Estimates*.

trend is a reflection of the softness of the labour market. Marginal workers are being squeezed out of the labour force, and many potential new entrants have been discouraged from seeking work by the knowledge that jobs are scarce.

Labour force participation rates are an indication of how persons react to changing labour market conditions. As shown in the accompanying table the total labour force participation rate increased from the first quarter of 1968 to the first quarter of 1969 and then decreased again in the first quarter of 1970. This could be partially due to the fact that when employment prospects are favourable, such as in 1969, persons who might otherwise not do so may be encouraged to seek employment. Accordingly, when job prospects are unfavourable such as they have been in the first quarter of this year marginal labour force participants may become discouraged and no longer seek employment.

LABOUR FORCE PARTICIPATION RATES, ONTARIO, POPULATION 14 YEARS OF AGE AND OVER

	First Quarter 1968	First Quarter 1969	First Quarter 1970
14-19 years	30.7	30.3	29.3
20-24 years	70.5	69.5	69.3
25-44 years	68.6	70.3	70.2
45-64 years	65.0	66.7	65.8
65+ years	14.4	15.3	13.3
Men	77.3	77.8	76.6
Women	35.4	37.0	36.8
Total	56.1	57.1	56.4

Source: DBS, Labour Force Survey.

Examination of the table below reveals that the participation rate for males seems to have fallen more sharply than that for females, while among the age groups, the 45-64 and 65+ groups appear to have been most seriously affected. A significant decline over the whole period is shown for the 14-19 age groups, however there is already an established declining trend in this area since more years of schooling have become a recognized necessity. Since the majority of older workers are male, this could explain the greater drop in male participation relative to that for females.

While attention has been focused mainly on the rise in unemployment it should also be noted that employment has been increasing. Provincial employment in March, 1970, totalled 2,892,000 — 25,000 above the comparable February figure and 36,000 higher than in March of last year. The important factor however, is that the labour force has been increasing far more rapidly than the number of job opportunities. The labour force increase between February and March, 1970, was 30,000 and the March total at 3,033,000 was fully 78,000 above the figure for March 1969.

Information now available for the month of April indicates that the Ontario labour force rose to 3,071,000, an increase of 38,000 over March 1970. At the same time the number employed reached 2,926,000 — 34,000 more than the previous month. The rate of unemployment in the province — 4.7 per cent — was slightly higher than that of 4.6 per cent recorded in March.

On a year-to-year basis the provincial labour force rose by 77,000 while the number employed rose 32,000 from 2,894,000 in April 1969.

Statistics for all of Canada indicate that unemployment dropped marginally from 6.7

per cent in March to 6.6 per cent in April. In April 1969 the rate was 5.4 per cent. Canada's unemployment rate for the first four months of 1970 averages 6.5 per cent compared with 5.7 per cent for the same period last year.

Canada Water Act Amended

Federal Energy, Mines and Resources Minister, J. J. Greene, recently introduced amendments to the Canada Water Act, including one giving the federal government the right to control phosphates and other nutrients. He told the parliamentary Committee on National Resources and Public Works that the amendments make the bill an even stronger means of combatting water pollution in Canada. The Canada Water Act has been in the hands of the Committee since early February. It is expected soon to go to the Commons for third and final reading.

The phosphate amendment enables the federal government to prohibit the manufacture and import of cleaning agents and water containers containing nutrients harmful to the ecological balance of Canadian waters. Fines of \$5,000 for each offence may be imposed and there is a provision for seizure of goods. The prohibition of phosphates is accompanied by a provision that regulations can be issued by the Governor-in-Council regulating other nutrient substances.

The amendments cover several areas of the Act, broadening its scope for redefining the need for federal-provincial co-operation and consultation in water pollution abatement. It is proposed that water resource management plans will be submitted to the provincial Minister involved for approval. Provision is made for public hearings in the planning process and the use of existing provincial agencies for joint programs.

The Public Sector and Economic Policy

Taxation and Fiscal Policy Branch,
Department of Treasury and Economics

INFLATION AND GOVERNMENT POLICIES IN 1969

The Problem of Inflation

Like most industrial economies, Canada generated inflationary pressures as it moved towards high levels of economic growth and employment in the late 1960s. The major problem confronting Canadian governments today, however, is the persistence of strong inflation in the face of an economic slowdown, a slowdown caused largely by restrictive monetary and fiscal policies designed to reduce inflation. This apparent inconsistency of persistent inflation in the face of a softening economy indicates the existence of fundamental imbalances in the economy. The aim of this article, therefore, is first to identify the imbalances which make inflation structurally endemic, and second to raise the question of the design and application of remedial policies.

Government Policies in 1969

In the past year, the federal government's fiscal and monetary policies have been directed almost exclusively toward the containment of inflation. Increases in federal expenditure were reduced below the growth of revenue to produce a budgetary surplus in 1969-70. A further surplus is planned for 1970-71. Credit availability has been limited and interest rates have risen sharply. In mid-1969, the federal government introduced a deferral of depreciation allowances on new commercial buildings in selected urban centres. The extension of this measure into 1970 is designed to reduce the level of construction activity, particularly in metropolitan Toronto.

At the same time, provincial and municipal governments trimmed expenditure growth in 1969-70. The difficulties of raising long-term capital and the constraints of revenue growth emphasized the need to control expenditures and to balance budgets. The net effect at the provincial-municipal level has been a reinforcement of federal fiscal and monetary policy and a deceleration of growth in the public sector.

Definite signs appeared by late 1969 that restrictive policy actions were affecting economic growth across Canada. While Gross Provincial Product in Ontario grew by 9.6 per cent in 1969, the growth rate is not expected to exceed 7.0 per cent in 1970. In Canada as a whole the growth rate is expected to fall from 9.3 per cent in 1969 to

Table 1 — Per Cent Changes in GNP Implicit Price Deflator
Seasonally Adjusted, Annual Rates

1968			1969			
II	III	IV	I	II	III	IV
2.8	4.0	3.6	2.9	7.5	4.5	2.2

Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts.

Table 2 — Regional Percentage Unemployment Rates
Seasonally Adjusted

	1968	1969	1969 - Quarterly			
			I	II	III	IV
Atlantic	7.3	7.8	6.5	8.1	8.8	7.8
Quebec	6.5	7.0	6.3	7.0	7.2	7.4
Ontario	3.6	3.2	2.8	3.4	3.1	3.5
Prairies	3.0	3.0	2.6	2.9	3.0	3.3
British Columbia	5.9	5.0	5.0	4.5	5.1	5.4
Canada	4.8	4.7	4.2	4.8	4.9	5.1

Source: Dominion Bureau of Statistics, The Labour Force.

6.8 per cent in 1970. Two difficult problems will continue to confront government economic policy in 1970. First, current monetary and fiscal policies appear to be affecting production and employment as much as prices. Second, the burden of this economic adjustment is occurring with particular severity in eastern Canada in the form of rising unemployment; in addition, there are now definite signs of rising unemployment in Ontario.

Tables 1 and 2 contrast the course of inflation and unemployment in Canada in 1969. On the one hand, Table 1 indicates a modest decline in the rate of inflation in 1969, in terms of changes in implicit GNP prices. The peak period of pressure was in the second quarter of 1969 when the overall level of inflation was equal to an annual rate of 7.5 per cent. By the fourth quarter, however, prices were estimated to be rising less rapidly, although there have been signs of continued inflationary strength in early 1970.

On the other hand, Table 2 reveals a worsening in unemployment in 1969. On an annual basis the regional picture is mixed: unemployment has been increasing in Quebec and the Atlantic Provinces, holding steady in the Prairie Provinces, and falling in Ontario and British Columbia. In all cases, however, unemployment was higher

in the fourth quarter than it was in the first quarter of 1969.

First-quarter data for 1970 point to increasing economic weakness this year. For example, the reduction in the rate of economic growth in Ontario to about seven per cent implies an increase in average unemployment rates from 3.2 per cent in 1969 to over four per cent in 1970. Supporting this expectation are anticipated slowdowns in consumer purchases of durables, exports, residential construction and corporate profits. The rate of increase in prices is expected to decline nominally from 4.3 per cent in 1969 to 3.9 per cent in 1970. Such developments in Ontario will be matched by similar trends elsewhere in Canada, particularly in the Prairies, Quebec and the Atlantic Provinces.

In conclusion, Ontario and Canada have entered 1970 in a state of considerable uncertainty, with the economy showing symptoms of the early stages of a recession. In early 1969, by contrast, buoyant employment and persistent inflation presented a clearer set of targets for economic policy. Current expectations pose serious doubts about the wisdom of maintaining the single-purpose thrust of monetary and fiscal policies against inflation.

Governments must reappraise the cost of continued deflationary policies in terms of

increased unemployment and below-potential economic growth. Consideration must be given to the implications of further restraint at the provincial-municipal level in terms of the accumulation of serious shortages in essential economic and social services and facilities. It is far from certain that the continued application of broadly restrictive monetary and fiscal policies will be effective in preventing increased inflationary pressures. These questions suggest the need for a basic re-examination of the ways in which government policy instruments can be used more flexibly and selectively to achieve orderly economic growth without inflation.

ECONOMIC STABILIZATION POLICIES IN 1970

This section examines the effectiveness of economic stabilization policies in counteracting inflation in Canada today. It underlines the urgent need for a more extensive inter-governmental analysis of existing economic policies. However, the discussion will be confined to the central issues and measures.

Present Policies of Governments

The federal government has stated its remedy for inflation: reduce the growth of aggregate demand even if this means increasing unemployment. In addition, some measures have been devised to have a special restraining influence on the growth regions of Ontario, Alberta and British Columbia. In its diagnosis of the problem, the federal government has maintained that excess demand in the growth regions is causing an inflationary surge in costs and prices that is overlapping into other regions.

The Ontario Government made a commitment in its 1969 Budget Statement to achieve a surplus in the 1969-70 fiscal year. This policy was adopted because the economy was sufficiently buoyant to absorb anti-inflationary restraints without creating unemployment. For 1970-71 the Ontario budget is holding to a prescription of modified restraint by avoiding inflationary tax increases and new demands on domestic capital. However, it will be moderately expansionary to offset the worsening employment situation.

Provincial government research examining the role and impact of the fiscal operations of the various levels of government in Ontario has demonstrated that federal fiscal actions have a built-in tendency to restrain

economic growth in Ontario. In times of increased federal restraint this "fiscal drag" in Ontario increases faster than in other regions. For example, in 1968-69, Ontario was subjected to a heavy burden of restraint by federal tax and expenditure policies equivalent to a 6.25 per cent loss of provincial personal incomes. In 1969-70, Ottawa's target of an overall federal surplus withdrew about \$1.8 billion from Ontario businesses and residents which increased the "fiscal drag" to more than seven per cent of personal incomes. Any further measures of economic tightening could cause increased unemployment and a recession whose repercussions would be felt throughout Canada.

The High Cost of Unemployment

The Ontario Government recognizes that the control of inflation has a high priority among economic policies. However, it does not agree that the objectives and methods of current fiscal and monetary policy are irrefutable. If the federal and provincial governments continue to retard economic growth, Canada could experience both higher unemployment and inflation as in the mid- and late 1950s. The basic strategy of price containment through tight monetary and fiscal policy measures has a number of disadvantages:

- it is economically wasteful because it puts people out of work and limits the nation's growth capacity;
- the less-developed regions suffer most;
- it hits industries indiscriminately and regardless of their direct influence on prices;
- it hurts smaller businesses and raises the cost of doing business;
- it restricts the supply and raises the cost of housing;
- it is accompanied by rising unemployment, hitting hardest at low-income earners and unorganized labour;
- it results in slower growth, lowering capacity utilization and productivity, and raising the unit costs of production;
- even if inflation is cured, the problem of the eroded purchasing power of the fixed-income groups remains unless compensation is provided.

Ontario, with a rapidly growing population and labour force, needs a continuous stream of private and public investment to create new jobs and raise living standards. Any attempt to cure inflation by creating

unemployment runs counter to the Ontario Government's objective of keeping unemployment at no more than three per cent of the labour force. This is a reasonable economic objective and it is imperative that a more sophisticated strategy than induced unemployment be found to cure inflation. The Ontario Government is not willing to accept the view that unemployment is a just and effective way of solving the problem. The effects will fall on the lowest income-groups in the community. It is inconsistent to propose economic goals of tax equity to help these citizens, while contributing to their loss of livelihood as the price of solving inflation.

Is Inflation Caused by Goods-Producing Industries?

Inflation has not been a severe problem in most of the manufactured goods industries. There is evidence of the moderate price behaviour in manufacturing industries in the index of consumer prices: durable goods' prices in 1969 rose by only one per cent. Prices of consumer non-durable goods, excluding food, were up by 3.1 per cent, which represented a sharp reduction from the 4.5 per cent of 1968.

The demand for consumer durable goods has weakened in recent months. Unemployment and lay-offs are increasing in those Ontario communities that rely on durable goods industries. The proposed use of consumer credit controls could reduce the already faltering demand for consumer durables. Further restrictive policies aimed at this sector could easily aggravate general recessionary tendencies.

International Factors

The international competitiveness of Canada is not immediately endangered by present inflationary trends. The major cost and price problems have been in goods and services produced largely for domestic consumption, for example, government services, construction, housing, food and personal and business services. It is likely that Canada's trading deficit on current account will be more affected by changes in economic growth here and in the United States, resulting from fiscal and monetary policies, than by an erosion of Canadian price competitiveness. The collapse of Canada's world wheat markets is of more immediate significance to the balance of payments and to regional economic health than price increases of manufactured goods

The Regional Aspects

Federal policies are designed to deflate the Ontario economy. The recent federal budget extended the deferral of depreciation allowances on new commercial buildings in Ontario cities. Other selective measures included:

- a tighter restriction of federal spending and loan activities in Ontario than in other regions;
- persuasion of the banks to differentiate regionally in their lending policies;
- the proposal to control consumer credit, the impact of which will fall heavily on Ontario manufacturers of durable goods.

In total these policies constitute a broad, unitary-state application of economic policy rather than a co-ordinated, intergovernmental package to increase output and lessen price increases.

The inflexibility of these policies is demonstrated by their inability to resolve the problem of inflation without penalizing economic growth in Ontario, and their further inability to increase output in the under-employed regions. High levels of unemployment have not stabilized prices in the low-growth regions. This is particularly relevant in the context of the alleged transmission of inflation from Ontario to other regions. Since little is known about inter-regional trade patterns, the assertion can neither be proven nor disproven with certainty.

A number of factors tend to produce uniform inflationary pressures in all regions. Among these are the effects of:

- monetary policy and the level of interest rates;
- the pace-setting wage and salary settlements for employees under federal jurisdiction;
- the steady increases in property taxes and provincial taxes across the country which register directly in price indexes and result in compensatory wage demands.

The use and extension of deferred depreciation allowances to cool off the construction industry must be acknowledged now as a failure. It underestimates the severe restraining effects of monetary policy and the strength and importance of service industry capacity; it has merely emerged as one more cost element in rising construction prices. This kind of device lacks real selectivity because it cannot discriminate according to local priorities. It is not likely to succeed without provincial-municipal economic planning support. The unilateral implementation of

this measure and its subsequent failure are indicative of the urgent need for alternative methods of establishing regional economic stabilization policies.

THE STRUCTURAL PROBLEMS OF INFLATION

This section examines some of the longer term structural problems in the Canadian economy encouraging inflation. Among these are public sector growth, the inflationary effects of tax increases, expansion of the service sector, population pressures, accelerated urbanization, and housing shortages. These longer-term structural forces are typically those which need co-ordinated long-run planning and cannot be effectively handled with short-run economic policies.

The Growth of the Public Sector

The competition between the public and private sectors in the 1960s was accompanied by intense intergovernmental competition for tax fields and unco-ordinated expansion of spending programs. Federal shared-cost programs, such as medicare, were imposed at a time when the public sector was already over-extended and unprepared to supply the required medical manpower inputs. On the finance side, the federal white paper proposals on tax reform were introduced without consideration of the parallel problems of

tax-sharing and integrated federal-provincial and municipal tax-structure reform.¹

Public sector command of national economic resources grew from about 31 per cent of Gross National Product in 1960 to almost 35 per cent in 1969. Total government revenues, including Canada Pension Plan funds, increased from \$9.4 billion in 1960 to about \$24.7 billion in 1969, an increase of 164 per cent compared to a growth in Net National Income of 104 per cent.² This expansion of the public sector was accomplished by bidding away resources from the private sector. This inevitably led to compensatory price and income demands in the economy at large and put pressure on labour costs in the construction and service industries.

Tax "Feed-Back" and Inflationary Cycles

Governments expanded their share of Gross National Product in the 1960s by raising taxes and incurring frequent deficits. In addition to the normal progressivity of personal income taxes there were increases in income tax rates, social security taxes, medical premiums, retail sales taxes, and property taxes, all of which accelerated the rate of growth of public sector revenues. Table 4 illustrates how the ratio of government tax revenues to personal income rose from 37 to 43 per cent, a structural shift that increased inflationary wage and salary demands.

Table 3 – Expansion of the Public Sector in Canada: Public Sector Expenditures Expressed as a Percentage of Total Gross National Expenditure

	1960	1969
Public Sector Expenditures	Per Cent	
Goods and services	18.6	19.8
Transfers to persons	8.7	11.0
Other payments	6.4	8.0
Total: (i) gross	33.7	38.8
(ii) excluding intergovernmental transfers	30.9	35.1

Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts (unrevised).

Table 4 – Public Sector Revenues and Personal Income

	1960	1965	1969
1. Personal Income (\$ million)	25,075	35,149	57,002
2. Public Sector Revenues (\$ million)	9,360	14,729	24,745
3. Revenues as Per cent of Income	37	42	43

Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts (unrevised), public sector revenues exclude investment income, withholding taxes and federal transfers to the provincial-municipal sector.

¹Ontario's views on integrated tax reform were set out in "Reform of Taxation and Government Structure in Ontario", Ontario Budget 1969. Ontario Department of Treasury and Economics, Taxation and Fiscal Policy Branch.

²Source: Dominion Bureau of Statistics, National Income and Expenditure Accounts (unrevised), Ottawa.

Much of this revenue was fed back into the personal income streams, either as direct transfer payments or as benefits in the form of services. The indirect tax increases affected individuals psychologically, and registered statistically as inflation in the Consumer Price Index.³

While taxes are a compulsory diversion of personal and business income and savings, the public does not accept this as a non-negotiable fact. Wage, salary and fringe benefit demands, and the competitive bidding for personnel, are sensitive to tax changes for many months after they occur. There is, therefore, a dual aspect to tax changes; in the first round the taxes may register as a decline in personal disposable income; in the second round compensatory wage and salary adjustments occur in response to this reduction in disposable income. Technically, if the market place is relatively fluid, only one tax increase is required to move an inflationary wave through the entire range of goods and services. Taxes are powerful inflation generators because they apply across broad industrial and regional segments of the market rather than in isolated sectors.

Urbanization and Population Growth

During the 1960s the high-growth regions absorbed very large numbers of people. The population of Ontario grew by one-quarter and that of British Columbia by one-third. Table 5 shows the comparative changes for the various regions over the last ten years.

Most of this growth occurred in the large urban centres. In the decade 1956-66 the absolute population of Ontario cities of 100,000 and over increased by 1.35 million persons, whereas the total increase in population in this period was about 1.50 million persons. This continuing concentration of

people and economic activities in the larger cities has generated economies of scale in many industries, but it has also produced pressures on the availability of serviced land and land prices, as is evident in the growth of apartments and high-rise office blocks. It has also demanded massive public capital outlays for schools, roads, hospitals, universities, sewage systems, parks, and recreation and conservation areas. This type of growth pressure contributed strongly to price increases over the period.

Costs in the Public Sector

In addition to the inflationary bias of public sector growth, there has also been a rapid rise in unit costs in public services over the past decade. In part, this was a result of the intense competition for skilled personnel between the private and public sectors of the economy. The public sector's requirement for teachers, nurses and professional and managerial skills rose rapidly through the 1960s in response to the need to effectively staff and manage the large number of community service facilities brought into operation. Standards of public service performance and administration were raised and the price for the necessary skills had to be met in order to attract competent staff.

The growth in service industry and public sector employment was one cause of the rapid rise in wages and salaries for these groups. However, there was also a long-run pressure to narrow wage and salary differentials between the public sector and the commercial sector. Although more restraint in the public sector might have lessened the strength of this movement, there would still have been a catch-up thrust in "service-occupation" salaries which would have occurred regardless of the impact of monetary and fiscal policy.

Inflation in operating costs and lags in the application of new technology have been a particularly severe and difficult problem in the provision of a wide range of public services. It is therefore a high priority of current Ontario Government policy to determine and to implement long-run managerial and technical changes in public services to improve productivity and lower unit costs. The Ontario Government's Productivity Improvement Project utilizes both business and government expertise to achieve these objectives. The establishment of a federal-provincial task force on cost-effectiveness in shared-cost programs is another example of the concern in this area and of the steps being taken to remedy the problem.

The Special Importance of Housing

Wage and salary demands are extremely sensitive to trends in the price of consumer necessities, such as shelter. Rent and the costs of home ownership constitute a large proportion of most family budgets; hence, the effect of inflation on these important costs leads the consumer to adjust his wage demands accordingly.

By 1969 shelter costs were rising at 7.5 per cent a year, which was faster than any other component in the Consumer Price Index. This behaviour resulted from four factors, two of which emanate directly from government policies:

- the high cost and limited availability of mortgage money;
- the dependence of municipal governments on property taxes as a major source of revenue;
- high rates of family and household formation;
- the impact of accelerated urbanization on land prices.

Policies of monetary restraint are counter-productive in curing inflation in this sector because the basic problems are long-term in nature. The housing sector requires co-ordinated public policies at all levels of government to minimize supply bottlenecks, speculative pressures, financing delays and high tax burdens.

CO-ORDINATING ECONOMIC POLICY IN CANADA

This section examines some alternatives to existing crisis-oriented economic policies. In particular, it suggests that Canada should aim for steady growth in the public and

Table 5 — Regional Population Growth in Canada — 1959-1969

	Population (000's)		Change 1969/59	
	1959	1969	000's	%
Atlantic	1,843	2,012	169	9.1
Quebec	5,024	5,984	960	19.1
Ontario	5,969	7,452	1,483	24.8
Prairies	3,046	3,499	453	14.9
British Columbia	1,567	2,067	500	31.9
Canada	17,483	21,061	3,578	20.5
Ontario as Per Cent of Canada	34.1	35.4	41.4	

Source: Dominion Bureau of Statistics, Estimated Population of Canada by Province, Ottawa.

³It is a limitation of the present method of registering inflation in official statistics that, if there is an increase in public sector output which is financed by indirect taxes, then components of the Consumer Price Index will automatically increase, regardless of whether

the public is "buying" an increased volume of public services with the increased taxes. In other words, if all public sector expansion in the 1960s had been financed by indirect taxes, then official statistics would have registered a significantly larger increase in the Consumer

Price Index. On the other hand, if they had been financed entirely by increases in personal income taxes, the direct effect on statistical measures of consumer prices would have been zero.

housing sectors. It also suggests the need for development of more effective and flexible policies to stabilize the private sector.⁴

The Economic Objectives of Federalism

Canada lacks national economic goals of an explicit order.⁵ Currently economic and social targets are typically embodied in the piecemeal introduction of individual programs, for example, medicare, regional development and tax reform proposals. In this process the overall priorities, the available options, and the very important ramifications for the total public sector are inadequately considered. For example, the substantial build-up of federal government fiscal capacity, as a result of the combination of a high revenue growth capacity and recent tax increases, has not been linked with any revealed strategy of economic objectives. (This build-up would be accelerated by the initial revenue gains and the increased growth capacity of income taxes under the new federal white paper proposals for taxation reform.) Under these circumstances, it is not possible at the present time to develop a co-ordinated set of federal and provincial-municipal priorities within a cohesive policy framework.

The Weakness in Existing Mechanisms of Co-ordination

The difficulty of controlling inflation in Canada illustrates the fundamental weaknesses in federal-provincial co-ordination of economic policy. The Standing Committee on Finance, Trade and Economic Affairs, of the Canadian House of Commons, has made the following two points in reporting on inflationary influences:

... the influence of governments at all levels needs to be examined in far greater detail. We noted that there has not been enough collaboration between the federal government and the provinces in discussing their separate spending plans.

The public should be able to expect that future expenditures of governments at all levels will occur only within the context of a set of clearly established priorities based on cost-benefit analyses and that existing expenditures will be perpetuated only if they pass continuing examination that utilizes worthwhile efficiency criteria.⁶

Current economic and fiscal debates in Canadian federalism are locked in a rigid framework of confrontation. To improve this situation governments must develop basic

research into new policy options and approaches. Little progress has been made in this regard since the Rowell-Sirois studies in the late 1930s. New policy systems must be more sensitive to the economic subtleties of federalism, rather than oriented to unitary-state economics. In particular, the growth of provincial and municipal responsibilities and functions must be recognized and accepted as a fact of federal life in Canada.

It is a matter of historical record that existing approaches to economic policies in Canada have been unable to achieve a lasting solution, either to long-run differences in regional growth or to short-term fluctuations in prices and business activity.⁷ A modernized fiscal policy would provide greater recognition of the complexities of inter-regional linkages and a more appropriate balance between the private and public sectors. It would also make provision for long-term technological changes, accelerated urbanization, and the rapid growth of the service industries.

The Importance of the Provincial-Municipal Sector in Policy Co-ordination

The distribution of powers by functional importance is weighted heavily in the direction of the provinces. The provincial-municipal sector accounts for close to 60 per cent of public sector expenditures in Canada, and for about 80 per cent of capital investment by all governments. Ontario accounts for 36 per cent of total provincial-municipal spending and is the source of about 42 per cent of the federal government's revenues. The growing importance of the provincial-municipal sector and the fiscal significance of the high-growth regions should be accompanied by a more important role for the provinces in overall policy formulation.

Economic Data Requirements

The economic data requirements of a co-ordinated fiscal policy extend beyond the present aggregative methods of the Tax Structure Committee.⁸ An urgent need exists to develop the economic data appropriate to a federal system of regional economies, each with unique characteristics and growth problems. The elements of a co-ordinated fiscal policy become ambiguous and unreliable in the absence of sound basic economic data on gross provincial products, regional flows-of-funds, the federal government impact in each province, and the inter-regional flows of

goods and services. In particular, there is a need for:

- a clearer recognition in federal government statistical gathering operations that Canada is composed of distinct regional economies;
- official economic data showing the impact of federal fiscal and monetary operations in each regional economy;
- a more intensive effort in economic forecasting and analysis at both the national and regional levels, with ample time for all participants to study and discuss the results;
- joint consideration of anticipated monetary policy including the regional implications of changing monetary conditions and the regional aspects of flow-of-funds;
- joint consideration of private and public sector capital needs, public borrowing, debt management and cash reserve policies, and utility financing;
- breakouts of federal revenue and expenditure projections by province, so that provincial economic and fiscal planning can take federal actions into account;
- consideration of the impact of tariff and trade policies on regional economies.

Only with improved economic data of this kind can effective liaison between governments be developed.

Sectoral Stabilization Policies

According to conventional economic theory, the public sector should manipulate its revenues and expenditures to be counter-cyclical. For the most part, this has proven to be an unobtainable goal. Discretionary changes are still cumbersome and likely to generate procyclical, or perverse economic effects.

Many of the difficulties of economic policy-making could be avoided if governments in Canada could agree to a long-run strategy to stabilize public sector growth. Such planned and co-ordinated development of the public sector over the long-run would have to be supplemented by automatic tax and social security stabilizers.

To define and stabilize the rate of growth in the public sector would require intergovernmental agreement on:

- the target share of GNP to be allocated to public sector uses over a period of years;
- a commitment to stable rates of expansion by each jurisdiction;
- an agreed long-term developmental plan with explicit priorities;

⁴Ontario has advanced proposals on the development of federal-provincial policy co-ordination at numerous intergovernmental conferences. See, for example, The Purpose and Objectives of the Tax Structure Committee, Ontario Department of Treasury and

Economics, Taxation and Fiscal Policy Branch.

⁵See Economic Council of Canada, Sixth Annual Review: Perspective 1975, Ottawa.

⁶Standing Committee on Finance, Trade and Economic Affairs, Minutes of Proceedings and Evidence. No. 14, second session, twenty-

eighth Parliament, 1969-70.

⁷For an evaluation of post-war fiscal policy actions, see Report of the Royal Commission on Taxation, Ottawa, 1966, Vol. II, Chp. 3.

⁸See The Purpose and Objectives of the Tax Structure Committee, Op. cit.

- performance targets, relating to cost and service levels in the public sector, to minimize the opportunity costs of public expenditures;
- automatic compensatory payments to the fixed and low-income persons, involving co-ordinated federal-provincial welfare systems;
- a long-range tax co-ordination program to lessen the provincial-municipal sector reliance upon regressive sales and property taxes and to increase their access to income taxes;
- timing and queuing of public sector issues in domestic capital markets.

This type of co-ordination is urgently required, for example, to encourage long-run orderly expansion of the supply of housing. The Canadian Parliamentary Standing Committee on Finance, Trade and Economic Affairs, in its fourteenth report says of the housing sector:

In the Committee's view the housing program should be used to meet the housing needs of the country and should not be used as a device for the stimulation or otherwise of the economy.⁹

This statement accords with the Ontario Government's view that housing is a high priority sector and should be incorporated into long-term stabilization plans.

The realization of stable public sector growth would not eliminate the need for counter-cyclical measures, especially where changes in foreign conditions affect Canada's balance of payments and the exchange value of the dollar. Nor would it eliminate the volatility of private investment, consumer durable sales, farm inventories, and foreign trade. It would, however, go a long way towards effectively isolating these problems for special stabilization treatment. There still would be a need to determine priorities in the

private sector and thus establish residual trade-offs against public sector programs.

Co-ordination of Tax Policies

The co-ordination of tax policies is one of the most pressing problems of Canadian federalism. The intergovernmental Tax Structure Committee was formed in 1964 for the purpose of projecting the expenditures and revenues of the public sector, and of studying the problem of fiscal balance and tax co-ordination. Its activities did not result in any major improvements in federal-provincial tax sharing. Two new ground rules have been established by the federal government since 1966. They are:

- no further increases in fiscal transfers to the provinces;
- the development of the Principle of Equal Access.

Under the first rule, the federal government argues that it cannot consider further increases in abatement of the personal income tax to the provinces because it needs to maintain a commanding majority position in the field for fiscal policy purposes. The Ontario Government has pointed out, however, that federal occupancy is far greater than that required both to meet the growth of its existing expenditure commitments and to change the total federal and provincial income taxes for fiscal policy purposes. This extra occupancy merely serves to provide the federal government with a high-growth revenue capacity to finance the continued introduction of new expenditure programs.¹⁰

Under the Principle of Equal Access each level of government is held responsible for raising its own revenues to finance expenditures. These two rules have prevented the development of a co-ordinated and harmonized federal-provincial tax structure in Canada. The federal white paper proposals

on taxation reform would worsen the situation by pre-empting the provinces from increased use of income taxes, and by increasing the flow of fiscal resources to the federal government. If the revenues resulting from these proposals are not to be shared with the provinces, then the problem of fiscal imbalance at the provincial-municipal level will be increased and the provision of essential public services will be adversely affected. The major question in tax co-ordination for Canada is how, under a regime of independent taxation, the various governments will move to solve their financing problems without the destruction of a uniform Canadian tax structure.¹¹

New approaches to this problem are necessary. There is a need for new conventions within which independent tax actions should take place. Existing intergovernmental finance discussions should be moved beyond the consideration of total revenue and expenditure projections into the following areas:

- the wider interprovincial implications of particular tax changes within the total tax framework;
- the economic implications and tax-exporting properties of certain tax policies;
- insight into which taxes are best used for particular types of objectives by federal and provincial-municipal governments;
- the essential requirements for complementary and non-competitive actions.

Conclusion

The foregoing article has reviewed some of the problems of designing and co-ordinating economic policies appropriate for Canada's diversified economy. It suggests that new initiatives are required to define national objectives and to strengthen Confederation. The paper is offered as an initial contribution by the Government of Ontario to this process.

⁹*Standing Committee on Finance, Trade and Economic Affairs, Minutes of Proceedings and Evidence, No. 14, second session, twenty-eighth Parliament, 1969-70.*

¹⁰*See Alternative Methods of Transferring Federal Tax Revenues to the Provinces, Ontario Government, August, 1966: presented to the federal-provincial Continuing Committee on Economic and Fiscal Matters, Mont Gabriel, September, 1966.*

¹¹*See Intergovernmental Finance and Ontario's White Paper on Provincial-Municipal Reform, Ontario Department of Treasury and Economics, Taxation and Fiscal Policy Branch: presented to federal-provincial Constitutional Committee, Ottawa, June, 1969.*

Selected Economic Indicators

Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



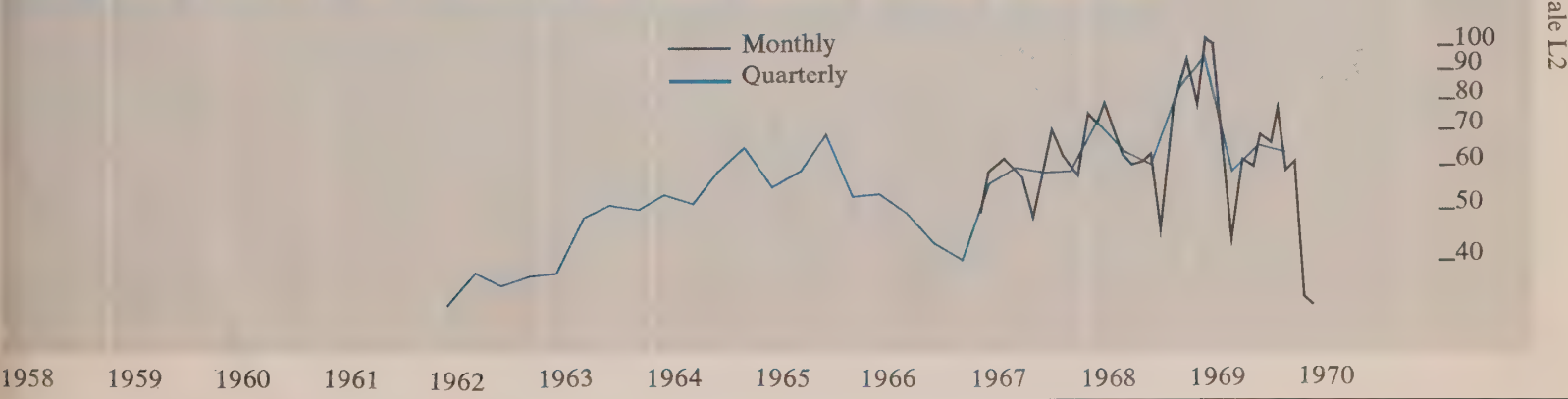
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Commercial/Institutional and Industrial Construction Contracts, Ontario



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970

Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
Scale L1
_30
_25
_20
_15
_14
_13



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

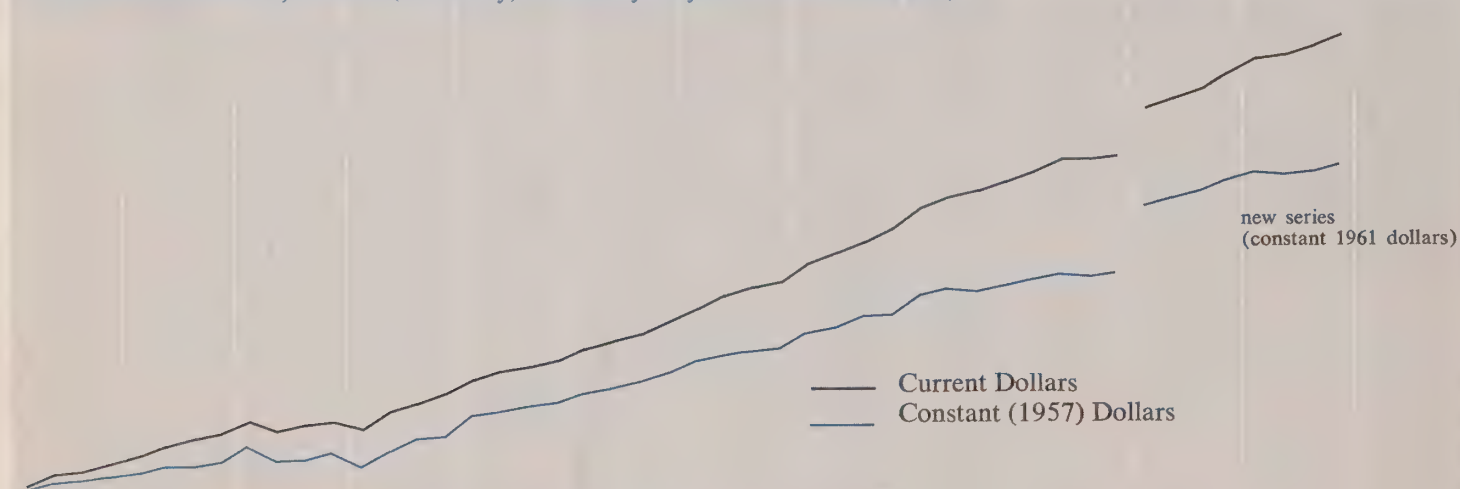
Index
Scale L2
_200
_180
_160
_140
_120
_100



Coincidental and Lagging Indicators

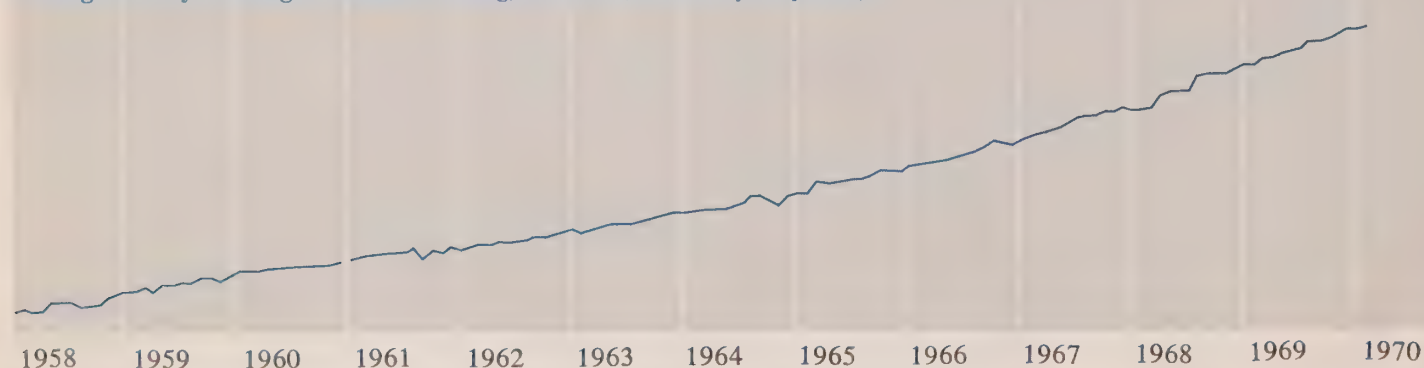
Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion
Scale L1
_80
_70
_60
_50
_40
_35



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Dollars
Scale L1
_3.00
_2.50
_2.00



Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent

Scale A



Employment, Ontario (Seasonally Adjusted)

Million

Scale L1



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of Labour Force

Scale A



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
1961 =
100

Scale L2



1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970

Economic Indicators

Seasonally Adjusted

	1969												1970		
	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	
Leading Indicators															
Average Weekly Hours Worked in Manufacturing															
New Orders in Manufacturing Industries ^c	40.4	40.5	40.1	40.4	40.1	40.2	39.6	40.3	39.9	39.9	38.4	39.7	39.9	39.6	
Commercial/Institutional and Industrial Construction Contracts	3,693	3,575	3,539	3,564	3,743	3,741	3,690	3,770	3,634	3,754	3,728	3,662	3,624		
Urban Housing Starts (Annual Rate)	157.9	140.6	126.1	112.8	93.9	144.0	127.0	123.2	86.6	137.3	140.0				
Money Supply ^c	109,700	102,400	79,900	45,300	63,900	60,800	69,300	67,300	78,300	59,100	64,700	36,600	34,800	55,700	
T.S.E. Industrial Index ^u	27,927	28,251	28,331	28,336	28,638	28,324	28,292	28,403	28,472	28,580	27,728	27,695	27,816	27,900	
Business Failures ^u	185.20	190.58	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37	177.89	183.92	185.17	
Business Failures — Liabilities ^u	59	55	58	48	35	32	51	52	64	54	53	56	71	82	
	3.2	2.2	3.2	1.9	2.0	0.9	2.6	4.8	3.4	4.6	2.2	9.9	18.7	4.0	
Coincidental and Lagging Indicators															
Gross National Product ^c (Annual Rate)		76,492			76,968			78,684						80,252	
Average Hourly Earnings in Manufacturing	2.84	2.88	2.89	2.92	2.93	2.94	2.97	2.97	2.99	3.02	3.06	3.06	3.08	3.10	
3-Month Treasury Bill Rate ^{c,u}	6.43	6.58	6.80	6.74	7.13	7.62	7.69	7.77	7.60	7.76	7.81	7.78	7.60	7.00	
Cheques Cashed in Clearing Centres ¹	6,032	6,428	6,243	6,066	6,152	6,458	6,560	6,570	6,526	6,521	6,240	6,078	6,099		
Retail Trade	886	862	866	866	875	884	886	901	892	895	909	891	869		
Labour Force	3,037	3,019	3,038	3,071	3,035	3,028	3,004	3,027	3,035	3,030	3,064	3,044	3,066	3,098	
Employed	2,947	2,940	2,948	2,958	2,926	2,935	2,910	2,932	2,930	2,927	2,957	2,948	2,957	2,981	
Unemployed	90	79	90	113	109	93	94	95	105	103	107	96	109	117	
Unemployed as % of Labour Force	3.0	2.6	3.0	3.7	3.6	3.1	3.1	3.1	3.4	3.4	3.5	3.2	3.6	3.8	
Wages and Salaries	1,256	1,264	1,271	1,288	1,295	1,318	1,303	1,312	1,318	1,336	1,347				
Index of Industrial Employment	131.2	131.5	131.4	131.4	131.0	129.6	129.3	129.6	130.7	132.7	132.8	132.1	133.1	132.8	
Index of Industrial Production ^c	168.0	171.3	167.7	167.0	167.1	166.8	164.5	165.9	165.6	169.3	172.0	171.1	174.4	171.1	
Total Manufacturing ^c	167.5	171.3	167.3	168.5	169.0	169.3	166.5	166.8	166.7	169.5	170.7	167.8	171.0	167.7	
Non-Durables ^c	150.8	153.6	150.2	150.6	151.1	151.6	152.5	153.0	152.4	153.4	154.3	152.3	154.3	152.5	
Durables ^c	187.8	193.0	188.2	190.3	190.8	191.0	183.7	183.8	184.1	189.2	190.7	186.8	191.4	186.4	
Mining ^c	160.6	162.1	155.7	145.5	142.6	138.9	136.2	141.8	140.3	151.8	163.4	170.2	175.7	169.5	
Electric Power and Gas Utilities ^c	184.3	184.7	186.2	186.1	187.1	189.0	190.1	194.6	195.5	194.6	197.0	201.0	203.0	203.2	
Primary Energy Demand (Annual Rate)	58.45	59.49	59.20	58.54	59.12	60.28	58.83	58.39	59.09	59.56	63.13	64.53	63.91	62.94	
Exports (including re-exports) ^c	1,243.8	1,295.7	1,194.2	1,233.6	1,212.5	1,196.0	1,161.7	1,293.4	1,283.0	1,285.0	1,312.9	1,457.3	1,403.7	1,366.2	
Imports ^c	1,194.2	1,178.3	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,220.1	1,206.7	1,223.2	1,215.0	1,120.2	1,232.4	1,242.1	
Unclassified Indicators															
Foreign Exchange Reserves ^{c,u}	2,820	2,779	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	2,616	2,698	2,777	2,936	
Industrial Materials Price Index ^{c,u}	263.5	264.1	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5	272.3	272.3	275.7	
Consumer Price Index ^{c,u}	122.6	123.2	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9	128.2	128.7	128.9	

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.



Ontario Economic Review

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Department of Treasury and Economics

**Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics**

H. Ian Macdonald, Deputy Minister



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U.K. Tax Cuts to Combat Inflation

R. G. Holloway, *Economist*
Department of Treasury and Economics

Design for Development: The Toronto-Centred Region

Regional Development Branch
Department of Treasury and Economics

Selected Economic Indicators

A publication of the
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and Economics
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Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About the Review

The feature article for the July/August edition of the *Ontario Economic Review* presents the first in a series of regional development reports under the Provincial Government's Design for Development Program. As implied by the title, this report on the Toronto-Centred Region provides the basic concept for the comprehensive development of an area within an arc extending 90 miles from Toronto.

This report is based upon a foundation of extensive and intensive research. A substantial contribution was made by the earlier Metropolitan Toronto and Region Transportation Study and by both public and private reactions to a published volume of that study, *Choices for a Growing Region*, released in June 1968. The report is also based on important suggestions from the five Regional Development Councils and the five Regional Advisory Boards within the broad area. Many of the Provincial Government Departments and Agencies have also contributed substantially. The final report was co-ordinated by the Regional Development Branch of the Department of Treasury and Economics under the general supervision of the Interdepartmental Advisory Committee on Regional Development.

In a short article on the recently announced United Kingdom tax cuts, R. G. Holloway of the Taxation and Fiscal Policy Branch, Department of Treasury and Economics examines some of the links between the high rates of U.K. taxation and inflation and outlines possible consequences of the proposed reductions.

Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

U.K. Tax Cuts to Combat Inflation

R. G. Holloway, *Economist*

Department of Treasury and Economics

There is nothing new in the theory that very high taxation is inflationary. More than twenty-five years ago the maximum tolerable peacetime burden of taxation was estimated by Colin Clark as 25 per cent of national income and Keynes lent his support to this view.

What is new is the weight of evidence which has accumulated to support this theory. The United Kingdom's experience over the past six years has been one of massive tax increases on a scale unprecedented in peacetime, with the burden of taxation rising from under 40 to over 50 per cent of national income. These massive tax increases have been followed by accelerated inflation. The latest indicators show retail prices rising at an annual rate of 10 per cent — twice the rate of a year ago and three times the rate experienced under the previous Conservative administration — with wage rates rising at an annual rate of 14 per cent.

Major Factors

Taxation has not been the sole cause of this inflation. Devaluation has been a major factor and a misallocation of resources resulting from misguided industrial location control is probably another. There have also been mistaken monetary policies and there can be no doubt that the Bank of England's support of the gilt-edged market (now abandoned) has been a prime factor. Since there have been many influences at work it is not possible to isolate and quantify the inflationary impact of taxation. There can be little doubt, however, that the new Government is right in its view that the very high taxation of recent years has been inflationary.

The Labour Government had been elected to office in 1964, and again in 1966, largely on the basis of its promise to achieve a higher rate of economic growth which would permit a substantial expansion of public services with no long-term increases in the burden of taxation. The Government was thwarted in this aim by the legacy of a £800 million balance of payments deficit which it inherited from the Tories and by its failure to recognize the necessity for immediate devaluation. The acute need for increased outlays on such items as roads and hospitals and political promises for higher pensions could not be abandoned, however, although the initial explosive increase in expenditure was eventually brought under control.

The massive increase in taxation under the Labour Government is partly illusory,

U.K. and Ontario Taxes Compared

	U.K. (1969-70)		Ontario (1970-71) ^a	
	£ millions	%	\$ millions	%
Taxes on income	6,575	36.9	1,416	28.5
Health insurance, etc. ^b	2,321	13.0	594	12.0
Import deposits	184	1.0	—	—
Local property taxes ^c	1,709	9.6	1,418	28.5
Other expenditure taxes ^d	6,292	35.3	1,364	27.4
Taxes on capital	762	4.3	177	3.6
TOTAL	17,843^e	100.0	4,968	100.0

^aExcluding tax revenue retained by the federal government.

^bContributions paid by employees may be classified as taxes on income and contributions paid by employers as taxes on expenditure. Employer contributions in Ontario are estimated as \$375 mn.

^cIn the U.K. these are assessed on the annual value of the property and levied on the occupier, except where occupation is by daily or weekly rental. The Ontario tax is assessed on the capital value and levied on the owner. The U.K. tax is therefore a tax on expenditure while the Ontario tax is a tax on capital. However, tax shifting makes the practical difference negligible.

^dIncluding vehicle licences and driver permits.

^eEquivalent to 51% of national income.

however, since much of the increased revenue was transferred back to the private sector, including industry. The taxes paid by corporations rose steeply with the abolition of capital allowances as deductions from taxable income, increases in the rate of corporation tax, and the introduction of redundancy fund payments, industrial training levies and the selective employment tax. However, much of the increased revenue was paid back to industry in the form of rebates, investment and training grants, and regional employment premiums. At the same time there was a net transfer from middle and upper income taxpayers to those with lower incomes and, in addition, a substantial switch in resources from capital formation in the private sector to public expenditure programs. Even where this public expenditure is productive (as in the case of motorways) the pay-back period is substantially longer than for private sector outlays on such items as plant and machinery. Under full or nearly full employment conditions, in the short term, such expenditure is inflationary.

Adverse Effects

The Labour Government recognized that the taxation of personal incomes had already reached a level where further increases would have adverse effects on incentives but it failed to recognize that higher taxes on profits penalized efficiency and restricted the supply

of capital, both from retained profits and from new equity issues. This situation was worsened in that the investment grants which the Government paid to manufacturing industry were given irrespective of the prospects for profitability. Further, the regional employment premiums probably resulted in a misallocation of resources, particularly if viewed over the short and medium run; while the redundancy fund and increases in social security payments enabled the unemployed to stay out of work longer without the hardship which would previously have been experienced.

Part of the burden of the higher taxation of corporate profits (seemingly one-half) was passed on to the consumer in the form of higher prices while the other half has been borne by the shareholder. But most of the burden of the selective employment tax and of the increases in purchase tax and excise duties was passed on in the form of higher prices or of a falling quality of services. Paradoxically, in the short run the effect of these higher taxes was both inflationary and deflationary. They were inflationary in the sense that they increased prices and they were deflationary in the sense that they dampened the growth in the volume of consumer expenditure — thus achieving their intended purpose in releasing resources for export and investment (which, however, remained depressingly low). In the longer

term, however, it has not proved possible to restrain wage demands made to compensate for the rise in prices, and the consequent rise in the volume of consumer expenditure has imposed an inflationary strain on resources.

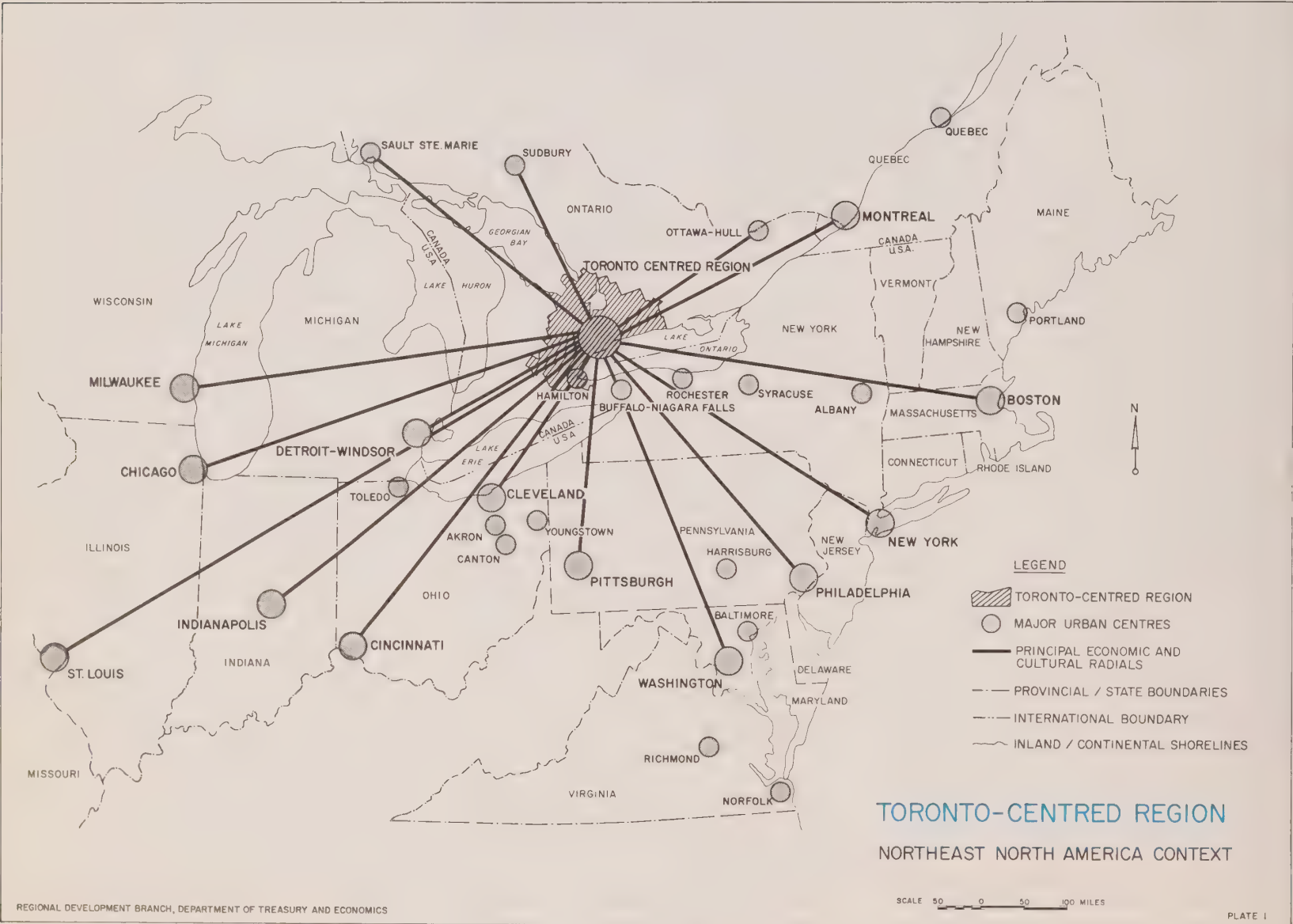
Promised Cuts

The Conservative Government has announced that it intends to cut taxes to combat inflation. The details of these cuts have not yet been announced but past policy statements indicate that the new administration appreciates both the inflationary effect of direct taxes through incentives and the inflationary effect of indirect taxes through wage demands, with secondary effects in each case. The Conservative policy is essentially

to cut the burden of direct taxes to improve incentives. It is also hoped that the resulting expansion of demand will lead to increased investment and productivity growth. If the short term impact on imports and the diversion from exports can be borne, this hope may very well be fulfilled. This is a big "if".

It is clear that the Conservative Government wishes to cut the standard rate of personal income tax and to lower the surtax which is imposed on those with substantial incomes. The Conservatives have also promised to modify the capital gains tax (an action which should improve the supply of savings) and they also intend to abolish the investment grants and regional employment premiums, thus permitting a cut in corporate

taxation. They have also promised to abolish the selective employment tax, though this probably means converting it into a general payroll tax or absorbing it in the value added tax which has also been promised. The evidence on the effect of a value added tax on prices is not conclusive but it appears that the short-term effect is inflationary while the longer-term effect is greater efficiency, resulting in enhanced growth — more than would be achieved through raising the same amount of revenue by taxing profits. A further reduction in the burden of the British taxpayer can be anticipated from the promised abolition of farming subsidies and the substitution of an import levy on food — a levy which must in part be borne by foreigners, notably including Canadians.



Design for Development: The Toronto-Centred Region

3

Regional Development Branch
Department of Treasury and Economics

INTRODUCTION

The approach toward a development concept for the Toronto-Centred Region began in December, 1962, when the Government of Ontario issued an Order-in-Council establishing the Metropolitan Toronto and Region Transportation Study, (MTARTS). In June 1968, the final report was officially released. Volume 2 of the MTARTS Study, *Choices for a Growing Region*, was a study of alternatives for the emerging development pattern.

The Government then requested public and private briefs so that an acceptable regional plan could be made. This process overlapped the province-wide planning, on a regional basis, that had already begun with the announcement of *Design for Development* in April 1966. An interdepartmental Goals Planning Committee was established to evaluate the incoming briefs and alternative Goals Plans set out in the MTARTS report.

In October 1969, the MTARTS study was enlarged and the new area was entitled the Toronto-Centred Region. Although the MTARTS study area was suitable for transportation planning, it was not entirely appropriate for regional planning. The added portion forms an arc outside the old MTARTS area, and includes Kitchener-Waterloo, Brantford, Midland, Peterborough, and recreation districts to the north and north-east.

Purposes of the Report

The purposes of this report are to establish the Development Concept as a guideline to be followed in all government decisions having an effect on the Region, and to provide a basis for public reaction as to how the Regional Development Concept can be carried out and how the broad proposals contained in it can be made more specific.

The section on Regional Development Perspective places the Region in the economic, social, and geographic context of north-eastern North America, Canada, and the Province of Ontario. The geographic structure and dynamic interrelationship of the Region with its Metropolitan core are described. The physical features which exert the predominant influences on the Region's shape are discussed. Finally, the changing parameters of development in the region are listed.

Five fundamental planning principles and twelve basic goals, all of which have been adopted as guides for decision in aiming at conclusions, are listed and explained.

Trends of the Region's past and current growth are described and evaluated against these principles and goals to yield a statement of present major inadequacies and future problems of such trends.

Finally, the focal points of future development policy are discussed along with the fundamental reasons for each. The urban pattern is stressed, with special attention to the Lake Ontario urbanized area and the potential for urban development elsewhere in the Region. Basic guidelines for regional land use are given. The special role of transportation is pointed out.

SUMMARY OF FINDINGS AND POLICY RECOMMENDATIONS

The Toronto-Centred Region's population is expected to reach the neighbourhood of 8 million by the year 2000, compared with 3.6 million in 1966.

Increases in family income, mobility and leisure time will make the Region more accessible and more extensively used. The Region will continue to grow as part of the Chicago-Detroit-Toronto-Montreal megalopolis and as the financial, manufacturing, cultural and communications centre of Canada and especially of Ontario.

Within the Region growth is increasingly concentrating in the metropolitan core and towards the west and south-west. There is only modest growth to the north and east — even in those places which have the capacity to attract their own residents and commuters and thus reduce congestion elsewhere.

From an *urban perspective*, growth is "suburbanizing" predominantly westward in a pattern that contains aspects of unstructured sprawl. Within the commuting area surrounding Metropolitan Toronto, quantities of land are being removed prematurely from agricultural and recreational use both for low density residential purposes and for speculation.

In the *peripheral belt*, which has a special recreation relationship to the urban population of the Lake Ontario urban corridor, summer residences are taking up sizable quantities of land, particularly along the lakefronts.

The problems of such trends, if they are not properly structured, can be broadly grouped as follows:

Massive Urbanization, Congestion: Difficulties in environment, housing, traffic, recreation, urban design and access to and from the hinterland.

Urban Form: Inefficiencies in the provision of flexible, least-cost, high-performance trunk services, such as transportation and water and sewer.

Region's Space and Resources: Insufficient use of districts with good development potential, but beyond easy commuting range of Metropolitan Toronto.

Provincial Integration: Detraction from effective integration of the northern and eastern parts of the Province with the Toronto-Centred Region because of the strong thrust to the west and southwest from Metropolitan Toronto.

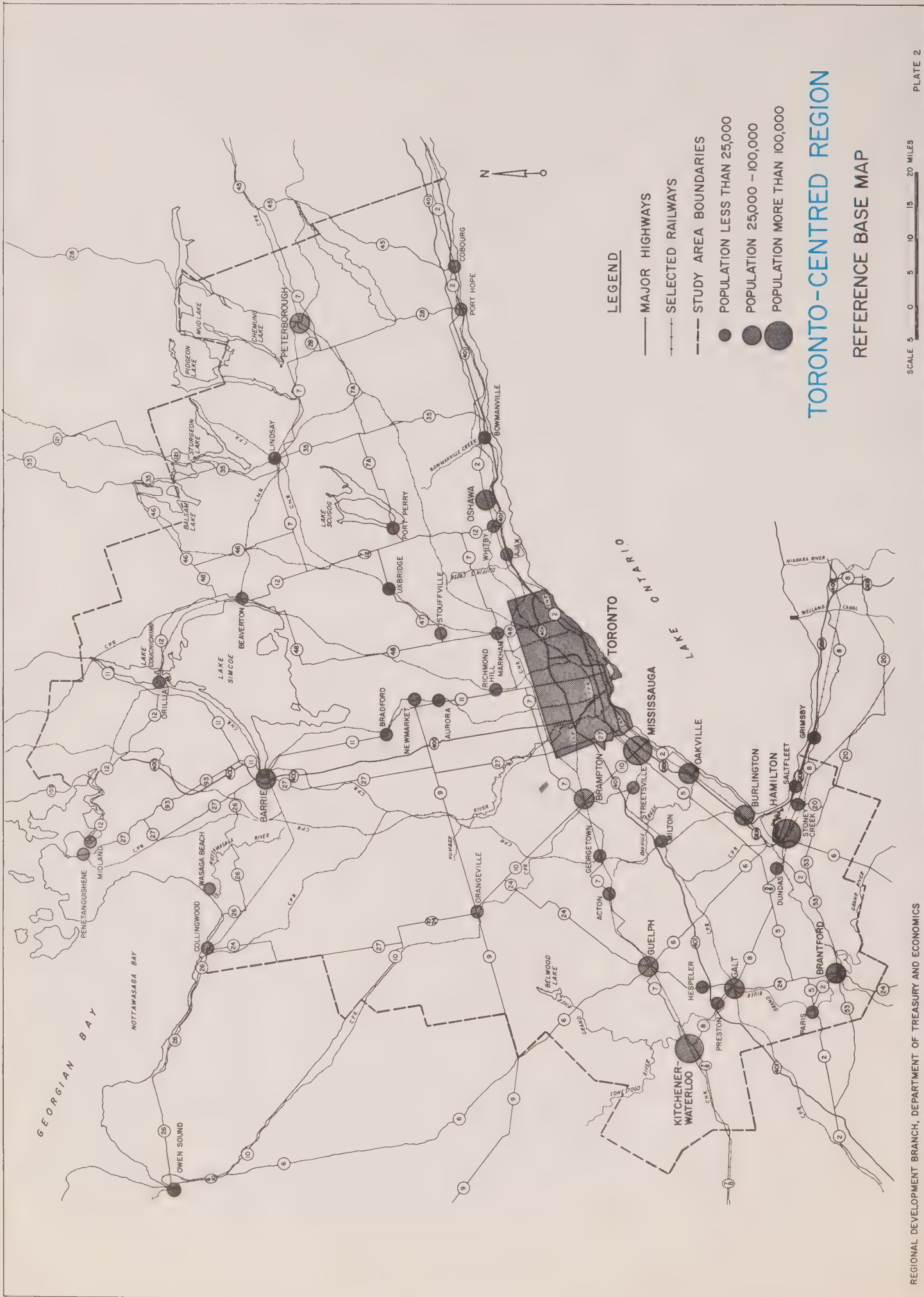
Regional Environment: Misallocation of prime recreation and agricultural areas.

The main purposes of the Toronto-Centred Region Development Concept are to: (1) shape the growth of the Region's metropolitan core into a two-tiered urbanized area, (2) encourage growth in selected communities beyond easy commuting range of Metropolitan Toronto, and thus help to decentralize the Region and prevent a swollen growth within and near Metropolitan Toronto, and (3) set basic guidelines for regional land use. Of the Region's expected population of nearly 8 million people, 5.7 million, or 71 per cent are targeted for the lakeshore urbanized area; 300,000, or 4 per cent for the adjacent commuting zone, and 2.0 million or 25 per cent for the peripheral belt. (These are shown as zone 1, 2 and 3, respectively, in Plate 3.) The key points of future development policy are:

Develop a well-structured, urbanized zone from Bowmanville to Hamilton for a population of approximately 5.7 million by the year 2000, the structure to be basically a two-tiered arrangement of cities separated by a parkway belt of open space with mainly non-urban uses, but containing high-performance inter-urban transportation and other trunk services. Stimulate the eastern corridor to a higher growth rate.

Encourage growth in key places to the north (such as Barrie and Midland) and the east (such as Port Hope and Cobourg) where there already exists an unused potential for development. If so encouraged, such places will attract their own daily commuters and thus will reduce commuting congestion to and from Toronto.

Try to resolve the growth problem of the Kitchener-Waterloo-Galt-Preston-Guelph area without drawing upon it to



make room for growth touched off by Toronto.

Reserve sizable districts northeast and northwest of Metropolitan Toronto for open space, conservation areas, recreation and agriculture.

Carefully encourage selected communities along the northern route between Metropolitan Toronto and Barrie (Richmond Hill, Aurora, Newmarket) using existing and prospective public facilities.

Maintain the Georgian Bay shoreline, Lake Simcoe, Kawartha Lakes and the Niagara Escarpment as well as parts of the Lake Ontario shoreline, for conservation and recreation uses for the expanding population.

Develop a transportation pattern to provide the best possible service for all parts of the Region as envisaged in this Concept.

THE REGIONAL DEVELOPMENT PERSPECTIVE

Development of the Toronto-Centred Region must consider: (1) the overall economic, social and geographic context in which the Region grows, (2) the geographic structure and dynamic interrelationships between the Region and the Metropolitan Toronto regional core, (3) the physical features which constrain and shape the Region's growth, and (4) the changing conditions of regional development, which continually alter the relationship of population to space.

The International, National, and Provincial Context

The first perspective of regional development in the Toronto-Centred Region is the international, national, and provincial context.

The development of the Region obviously is greatly dependent upon the role of the Region in the Northeastern quadrant of North America, in Canada and in the Province of Ontario.

- a) The Toronto-Centred Region is strongly influenced by surrounding major metropolitan centres of Northeast North America — New York, Boston, Detroit, Chicago, St. Louis, Montreal. The market within 500 miles includes 90 million people. (see Plate 1).
- b) The Region is in close proximity, and has strong economic linkages, to the heartland of American industry, which is found in the Chicago-St. Louis-Cincinnati-Cleveland quadrilateral and reaches

eastward, in both Canada and the United States, to such leading seaports as Montreal and New York.

- c) With increasing economic interdependence, these linkages have stimulated a development corridor between Chicago and Montreal (the Great Lakes-St. Lawrence Megalopolis) of which the Toronto-Centred Region is a major sector.
- d) Because of the location within the Great Lakes-St. Lawrence Megalopolis, the Toronto-Centred Region probably can increase its economic role in processing resources which currently originate in Northern Ontario, and move to major markets in the Chicago-Detroit-Cleveland industrial area.
- e) This Region performs a leading manufacturing, financial, and cultural role in Canada. The manufacturing predominance is partly a result of the adjacent location to American firms with branch plants producing for the Canadian market. Metropolitan Toronto is a focus of cultural and financial leadership in meeting national aspirations. It also is a national communications centre.
- f) The primacy of the Region in the Province's economic, social and cultural life needs no elaboration. The Region accommodated 3.6 million of the Province's 6.96 million people in 1966. This was 52 per cent of the total, and the proportion is still rising.
- g) The inequity of opportunity and income between the Toronto-Centred Region and the Georgian Bay, Northeastern and Eastern Ontario regions, is one of the Province's most critical development problems.

Geographic and Functional Structure of the Region

The Region is shown on Plate 2. The second perspective is the set of geographic and functional interrelationships among (a) the lakeshore urbanized area, (b) the commutershed, and (c) the peripheral zone.

- a) The *lakeshore urbanized* area is that zone which encompasses the Metropolitan core itself, plus reasonably adjacent urban settlement. On Plate 3, this is shown as Zone 1.
- b) The *commutershed* is that zone beyond the lakeshore urbanized area but within easy daily commuting range of employment in Toronto. On Plate 3, this is shown as Zone 2.

- c) The *peripheral zone* is that belt beyond the commutershed which is still well within the orbit of highly specialized influences of the Metropolitan core. Its economy is tied to the Region's core, and it acts as open space and recreation territory for the urban population. On Plate 3, this is shown as Zone 3.

In this three-zone geographic breakdown shown on Plate 3, the actual boundary lines are drawn to reflect improvements in transportation and continued mass urban development along the Lake Ontario shore.

The highlights of the functional interrelationships of these zones in the Toronto-Centred Region are as follows:

- a) The southwestern districts of Zone 3 are well developed, with urban places functionally tied to the Metropolitan Toronto core.
- b) The northern and northeastern districts of Zone 3 now have a special recreational relationship to the population of Metropolitan Toronto, but offer promise of urban development.

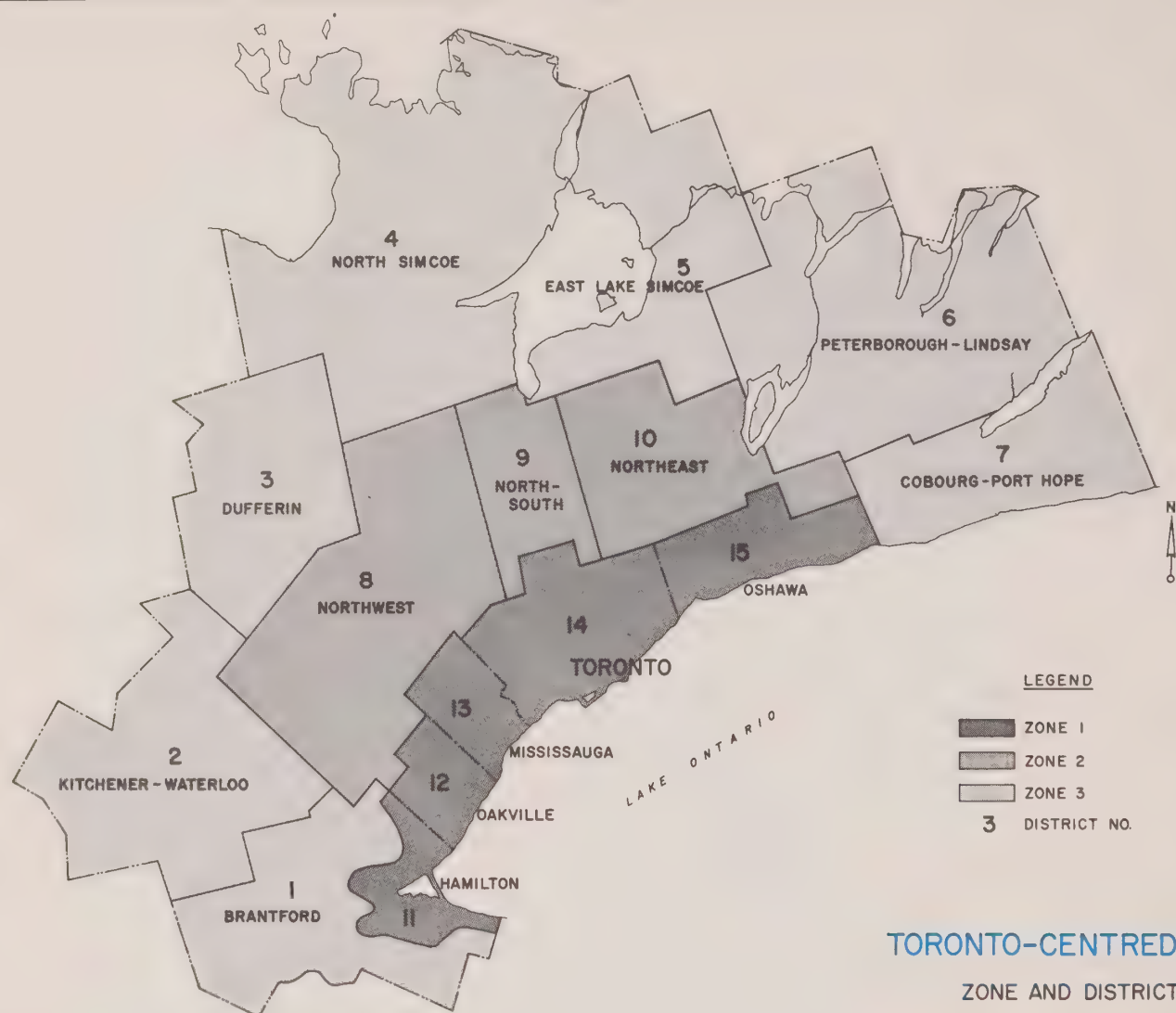
Physical Features which Shape the Region

Very prominent physical features set the northern, eastern and southern boundaries:

- a) The shape of the land area of southwestern Ontario, and its two-point connection to the American land mass exert a very strong westward attraction in the direction of development.
- b) The Georgian Bay shoreline and the edge of the Canadian Shield provide a physical border to development in the north and northeast.
- c) In the eastern part of the Region, the Canadian Shield forces development into a narrow neck of land along Lake Ontario.
- d) The location of the Region and Metropolitan Toronto on a more or less straight shoreline limits development to a semicircular arc.

Physical features shape regional growth by acting either as constraints or attractions to development.

- a) The high quality agricultural land which is predominantly to the west of Metropolitan Toronto was the earliest attraction and therefore set historical development patterns.
- b) The location of Lake Simcoe makes Simcoe County a natural transportation corridor to Northern Ontario.



REGIONAL DEVELOPMENT BRANCH, DEPARTMENT OF TREASURY AND ECONOMICS

- c) The interior watersheds do not have extremely large rivers to tap for water supplies and to carry treated sewage effluent, thus limiting the location of larger urban centres to the Lake Ontario Shore or to Georgian Bay, rather than the interior.
- d) The scenic and recreational assets of the Niagara Escarpment, Lake Simcoe, the Georgian Bay shore and the Kawartha Lakes naturally restrict their use for urban purposes.

Changing Regional Development Conditions

Population growth in the Toronto-Centred Region is expected to continue at a high rate. From a 1966 base of 3.6 million, the population is expected to reach close to 5 million

by 1981 and nearly 8 million by the year 2000. The relationship of the population to the Region's resources and space will be altered by three types of change:

- a) Family incomes are expected to triple by the end of the century, and approach \$15,000 per family (at today's price levels).
- b) Leisure time is expected to increase with the possibilities of the considerably shorter work week and longer vacation.
- c) Mobility will be considerably greater.

The major influences associated with these changing conditions are higher education levels and technological innovation.

These changes can be expected to manifest themselves in greater per capita space requirements both within the urban centres

and in the rest of the Region, especially in recreation areas. Increase can be anticipated in residential and transportation space per capita and in employment space per employee.

These and related changes must be anticipated and planned for. As applied to Toronto, such planning can be expected to be applicable to an ever-widening area. Only 35 years ago, the City of Toronto and the older suburban towns encompassed less than 100 square miles. When Metropolitan Toronto was formed in the mid-1950's, the administrative area was 240 square miles and the planning area more than 700 square miles. But the MTARTS planning area was about 3,200 square miles, and the Toronto-Centred Region encompasses 8,600 square

miles for prime impact, while the interaction area comes to about 15,000 square miles.

PRINCIPLES OF DEVELOPMENT AND SELECTED REGIONAL GOALS

A set of regional goals was adopted to assess present growth trends and plan the Region according to a basic set of values. As a result, five basic principles were developed.

Development Principles

The development concept rests on five basic principles, each of which relates both to current and future conditions:

1. The principle of *linearity*, which seeks as far as possible to align urban places along a series of more or less straight paths to take maximum advantage of parallel routes for transportation and services.
2. The principle of *functional efficiency*, which seeks a best set of political, economic, and social relationships for all urban and rural places.
3. The principle of *decentralization*, which emphasizes (a) the importance of metropolitan centre influence, and (b) a logical distribution of urban places within a metropolitan region, with special attention to the encouragement of smaller centres which functionally are related to the metropolitan region, but geographically are located beyond easy commuter range to the metropolitan centre.
4. The principle of *space conservation*, which stresses, on a per capita basis, adequate open space and recreational requirements.
5. The principle of *natural resource conservation*, which stresses the need for careful use of land, water and air.

Goals for the Region

Each of the following 12 goals has social implications, although these are mentioned specifically only in Goal 11. In accordance with the recommendations of our internal committee working on the Report, the vital social implications are to be considered in conjunction with all twelve goals. The goals are:

1. To facilitate the achievement of the Region's economic potential, consistent with the overall provincial interest and development.
2. To preserve the unique attributes of the regional landscape.

3. To minimize the urban use of productive agricultural land.
4. To minimize the pollution of water and the atmosphere.
5. To facilitate and maintain a pattern of identifiable communities.
6. To provide best possible accessibility for the movement of people and goods.
7. To provide essential transportation, water and sewer facilities at minimum cost consistent with overall benefit.
8. To maximize opportunities for using specialized services and facilities.
9. To develop in a manner consistent with the needs arising from long-term population trends, particularly in scale of growth and anticipated changes in household size and composition, and in age distribution.
10. To develop in a manner consistent with emerging and probable future technological innovations, i.e. to facilitate, adjust to, and receive the benefits of such possibilities.
11. To develop in a manner consistent with the needs arising from social changes resulting from future economic and technological developments, e.g. changing patterns of leisure.
12. To develop the Region in a manner that provides flexibility.

TREND PATTERNS AND INHERENT PROBLEMS

The Pattern of Trends

The pattern for the Toronto-Centred Region reflects a process guided by present and past public policies — in effect, unco-ordinated public policy. The predominant trends are as follows:

1. From a regional perspective, growth is concentrating at the Region's core, i.e. Metropolitan Toronto.
2. From an urban perspective, growth is "suburbanizing" into patterns with aspects of unstructured sprawl, with considerable intensity along the major transportation axes, and infilling of low density sprawl between these axes. Sprawl tends to be westward, toward the developed south-western part of the Province. Coincident with this process is the continued intensification of high rise developments close to the Toronto central business district and other urban focal points.
3. In the commutershed, especially toward the north-west, the country resident who is employed in Toronto is taking up large

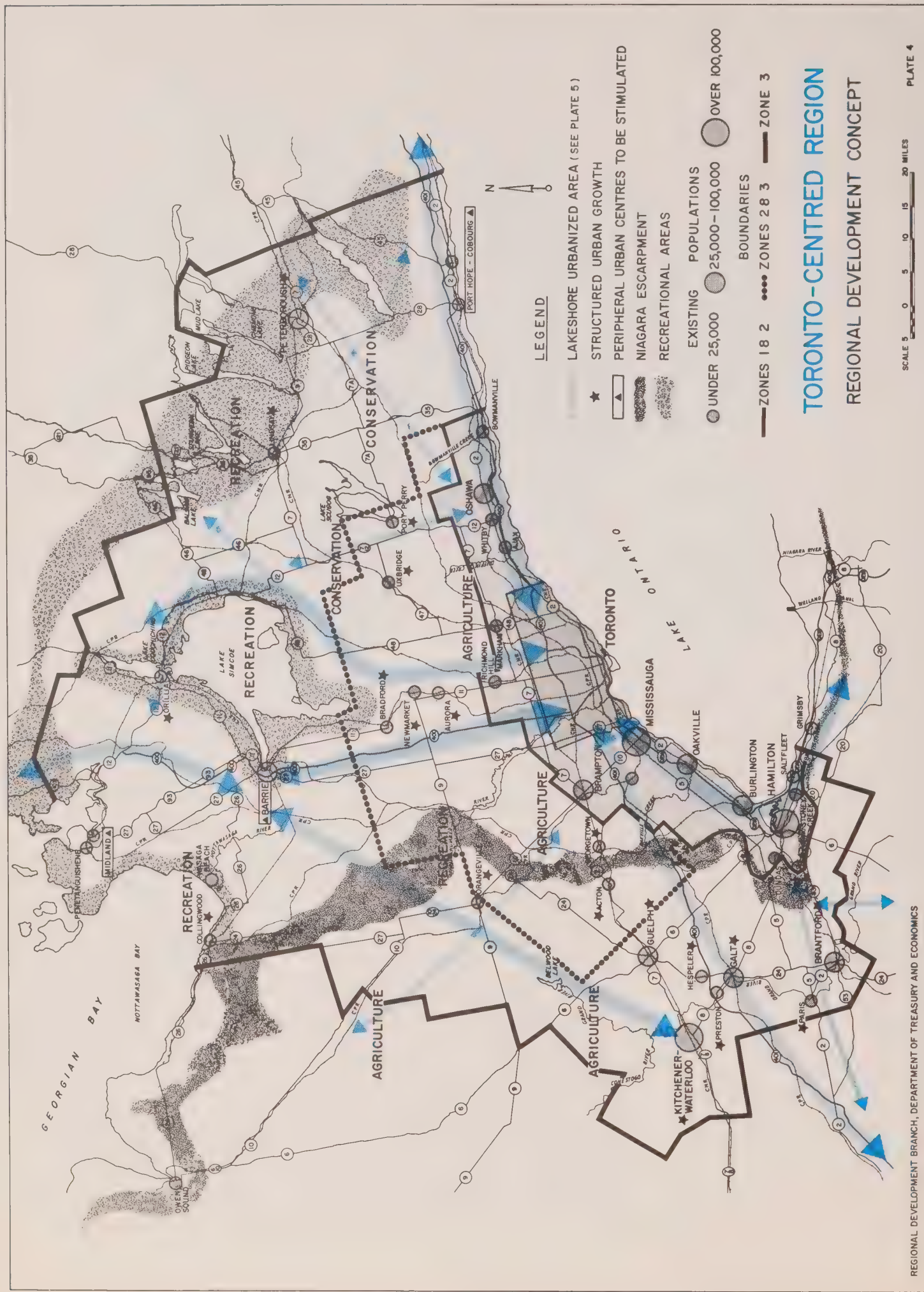
tracts of land. This practice is removing from use large quantities of prime agricultural and recreational lands.

4. The peripheral areas are growing at a very modest pace in the eastern, north-eastern and northern segments of the peripheral arc. But along the western peripheral segment, especially around Kitchener-Waterloo, there is considerable growth in an area which will be difficult to provide adequately with sewer and water facilities.
5. Summer residences are taking up large areas of land in recreation areas, particularly along lakefronts.

Emerging Problems of Trends

The major trends problems and their implications can be categorized as: (1) those relating to extensive urbanization; (2) those related to the urban form created by aspects of unstructured sprawl; (3) those related to the inadequate use of districts with high development potential; (4) those related to the lack of provincial integration; (5) those related to the misallocation, misuse and consequent damage to non-renewable regional resources.

1. Some problems of extensive urbanization are those of pollution, bad housing, traffic congestion, lack of recreation, unsuitable urban design, poor access to and from the hinterland and sheer lack of space. The problems of Metropolitan Toronto stem especially from the high rate of population growth of an already densely populated area. The basic problems are:
 - a) The shortage of land for housing is acute; and, together with capital shortage, has priced home ownership beyond the reach of a large proportion of the population. This has led to disruption of otherwise stable neighbourhoods and a deteriorating residential environment near the heart of the metropolis.
 - b) Industrial land also is in increasingly short supply in some areas.
 - c) In parts of Metropolitan Toronto, the local street system is rapidly becoming obsolete because of an increasing number of high density developments.
 - d) The tremendous increase in people adds to the cost of streets — both in upkeep and expansion. Expensive basic facilities in good condition become inadequate and must be renewed prematurely.



- e) Requirements for the so-called soft services, such as education, are becoming harder to meet.
 - f) Extension and improvement of public parks and open spaces become difficult.
2. The problems associated with the urban form of unstructured westward sprawl are sheer inefficiencies in the provision of economic, adequate transportation and service networks.
- a) The westward thrust of growth is not offset, at least in part, by an active eastward growth. This makes a transit system difficult to operate, by requiring high-capacity facilities which are not needed throughout the system.
 - b) Radial development, when the routes are widely separated, makes it difficult to put an optimum population within reach of high performance transit, water and sewer services.
 - c) Unstructured sprawl, where it exists, can create costly road and service systems, and reduce the choice of transportation means, thereby decreasing efficiency.
3. Inadequate use of the Region's space and resources results in lost opportunities and difficulties in long-term growth.
- a) Transportation could be more economically utilized if traffic flows occurred more evenly and rail lines were used to higher capacity.
 - b) Some outlying locations offer better access to the more charming parts of the Region. Settlement there would reduce the recreation traffic since these residents would not live in Metropolitan Toronto. This in turn would improve hinterland access to those who do live along the Lake Ontario shore.
4. Current trends do not foster provincial integration in either the geographic, social, or economic sense. Just the opposite; such trends, concentrating in the Region's core and thrusting west, reinforce existing strong linkages among the well-developed south-western parts of the Province, but do little to strengthen the linkages and ties with Northern or Eastern Ontario.
- a) The possibility of greater interaction between the Toronto-Centred Region's skills and markets and Northern Ontario's resources becomes more

remote as does the connection with the Eastern Ontario economy. The northern and eastern areas of Ontario, therefore, simply are not stimulated to further growth by the structure of the Toronto-Centred Region

- b) The trend pattern does not move growth into areas of low income, which lie north and east.
- c) Socially, the relationships between Northern Ontario, Eastern Ontario and the Toronto-Centred Region become weakened, reducing the overall sense of provincial identity.

FOCAL POINTS OF DEVELOPMENT POLICY FOR THE TORONTO-CENTRED REGION

The general guidelines presented here are designed to help overcome the emerging problems of trends, fulfil the goals as much as possible, and be consistent with the principles of development (Plate 4). As mentioned previously, implementation of this seven-point program is expected to be accompanied by a relative shift of population. Whereas in 1966, 75.6 per cent of the population was in the Lakeshore urbanized area (Zone 1), 4.5 per cent in the commutershed (Zone 2), and 19.9 per cent in the periphery (Zone 3), by the year 2000 the relative distribution is expected to be approximately 71 per cent, 4 per cent and 25 per cent, respectively.

Of the seven points in our program, the first five relate to the individual zones, whereas the last two apply to the Region as a whole.

1. Develop a well structured urbanized area (Zone 1) along the Lake Ontario shore from Bowmanville to Hamilton.
2. In the peripheral zone (Zone 3) develop such urban areas of reasonably significant size as Barrie and Midland in the North Simcoe district, and another at, or in the vicinity of, Port Hope-Cobourg. This reflects the conviction that decentralization of high growth from Metropolitan Toronto must begin soon and that these are appropriate places to encourage new growth.
3. Also in the peripheral zone, determine the roles of the Kitchener-Waterloo-Guelph-Galt urban cluster and of other key urban places, and resolve the current physical development constraints.
4. Within the commutershed (Zone 2) adopt a policy of retaining land as much

as possible for recreation and agricultural and open space uses. This policy would concentrate limited growth mainly within existing communities.

5. However, also within Zone 2, develop a small urban axis north of Metropolitan Toronto towards Barrie.
6. Maintain the Georgian Bay shore, Lake Simcoe, the Kawartha Lakes, the Niagara Escarpment, valley systems of the commutershed, and other key places as recreation and open space areas.
7. Create a transportation plan that will articulate the proposed Development Concept.

The Lake Ontario Urbanized Area (Zone 1)

The Development Concept for the Lakeshore Urbanized Area from Bowmanville to Hamilton is a modification of Goals Plan II of the Metropolitan Toronto and Region Transportation Study (see Plate 5). Zone 1 is expected to accommodate 5.7 million of the Region's 8 million people by the year 2000. Of this number, approximately 3.1 million are expected to be in Metropolitan Toronto and its immediate northern fringe, 1,850,000 are expected to be west of Metropolitan Toronto, and 750,000 east of Metropolitan Toronto. This calls for a considerable shift within Zone 1 both east and west from the Metropolitan area.

1. The urban centres are arranged in a linear urbanized area from Bowmanville to Hamilton.
2. The eastern portion of this area, extending from the boundary of Metropolitan Toronto to Bowmanville, is to be stimulated.
3. The structure is to be basically a two-tiered arrangement of cities in both the eastern and western parts of the urbanized area.
4. Hamilton and Oshawa-Columbus are projected as the major terminal cities, especially for mass transit. These will act as regional centres to promote economic and social identification and efficiency.
5. Urban centres of the urbanized area are to be separated by a Parkway Belt system of mainly non-urban uses, and at the same time connected by a regional transportation network. This would connect the cities, and be comprised of facilities incorporated into the Parkway Belt. The water supply and sewage disposal systems would be lake-oriented.



TORONTO-CENTRED REGION

DEVELOPMENT CONCEPT FOR ZONE I

The choice of a linear urbanized area of distinct urban centres, as opposed to a radial spread, emphasizes the need for: (a) a highly integrated transportation system at reasonable cost, and (b) a low-cost, efficient, non-polluting water and sewer-servicing scheme. The linear arrangement would generate sufficient traffic to make workable a highly sophisticated transit system, compared with the less desirable, somewhat unbalanced, automobile-oriented traffic system normally accompanying trends. The linear urbanized area, arranged along the Lake Ontario shore, provides substantial economies in services. If the trend pattern continues, settlement will move into areas off the lakeshore. These areas do not possess major rivers which could be used for water supply and which could carry treated sewage effluent without damage. Such settlement would require long water and sewage piping. Similar economies may be possible in the future extension of hydro transmission lines, whether above or below ground.

The stimulation of the eastern urban corridor, from Metropolitan Toronto to Bowmanville, is based on increasing efficiency in the transportation system, developing large quantities of land for all purposes such as housing, making better use of the Lake Ontario waterfront, helping less prosperous parts of the Province, and bringing populations closer to the recreation lands recommended for the eastern shore of Lake Simcoe, the Kawartha Lakes and further north. The problem of opening up enough land for the desired low-density housing simply cannot be met through exclusively westward development.

The two-tiered arrangement, as opposed to the single-tiered arrangement, is related to the need for two transportation corridors. One reason is that a single corridor would be overloaded. A second is the need to tie the urban growth into recognizable communities within a workable urban hierarchy. The design of each of the urban centres would try to link the location of the central business district and high-density housing to the regional transportation system. For the upper-tier cities, particularly, these two components would be placed adjacent to the Parkway Belt within which the transportation system operates. This is generally consistent with the concept of community structure as expressed in *Choices for a Growing Region*.

Regional centre roles are expected for Oshawa and Hamilton. These two would also be the terminal cities for mass transit. These

two centres would exert sufficient force through social, cultural, employment and government activities to reduce peak-hour traffic to and from Toronto in the corridors. Other urban centres to the east, west, and north have been assigned lesser roles. In essence, the structure is designed to offer a variety of types of urban centres, both by function and size.

The vital and unifying organ of the entire system is the Parkway Belt. This is a multi-purpose service system which would incorporate many kinds of transportation, pipelines and electrical power lines, water and sewer lines, where applicable, with open space added. It would reduce the number of separate swaths cutting through future urban communities. Defined open space would provide trails joining intersecting ravines and the abutting parks, a buffer against traffic noise, room for selected low-density public facilities, and respite from the frustrations caused by continuous urbanization. The essentials are that it would include as many parallel transportation facilities, servicing and energy facilities (pipelines as well as electrical) as possible, and at the same time provide the greatest degree of flexibility for the future.

The Zone 1 concept presented here does not deal at any length with the location of sub-regional centres and related transportation corridors within Metropolitan Toronto. However, care has been taken to ascertain that the Concept here presented relates to plans being developed within Metropolitan Toronto.

The Peripheral Zone (Zone 3)

Recommended policy for the peripheral zone (Zone 3) is similar to that in Zone 1. This policy depends heavily upon encouragement of economic activity in the north and east, and encouragement of only modest growth in the west. It is expected that, by the year 2000, a population of 2 million people will be living in Zone 3. This will amount to a 25 per cent share of overall regional population.

Development of the North Simcoe and Port Hope-Cobourg Districts:

From the northern and eastern segments of Zone 3, the Development Concept recommends:

1. Encouragement of the development of such centres as Barrie and Midland from 1970 to the year 2000 and beyond;

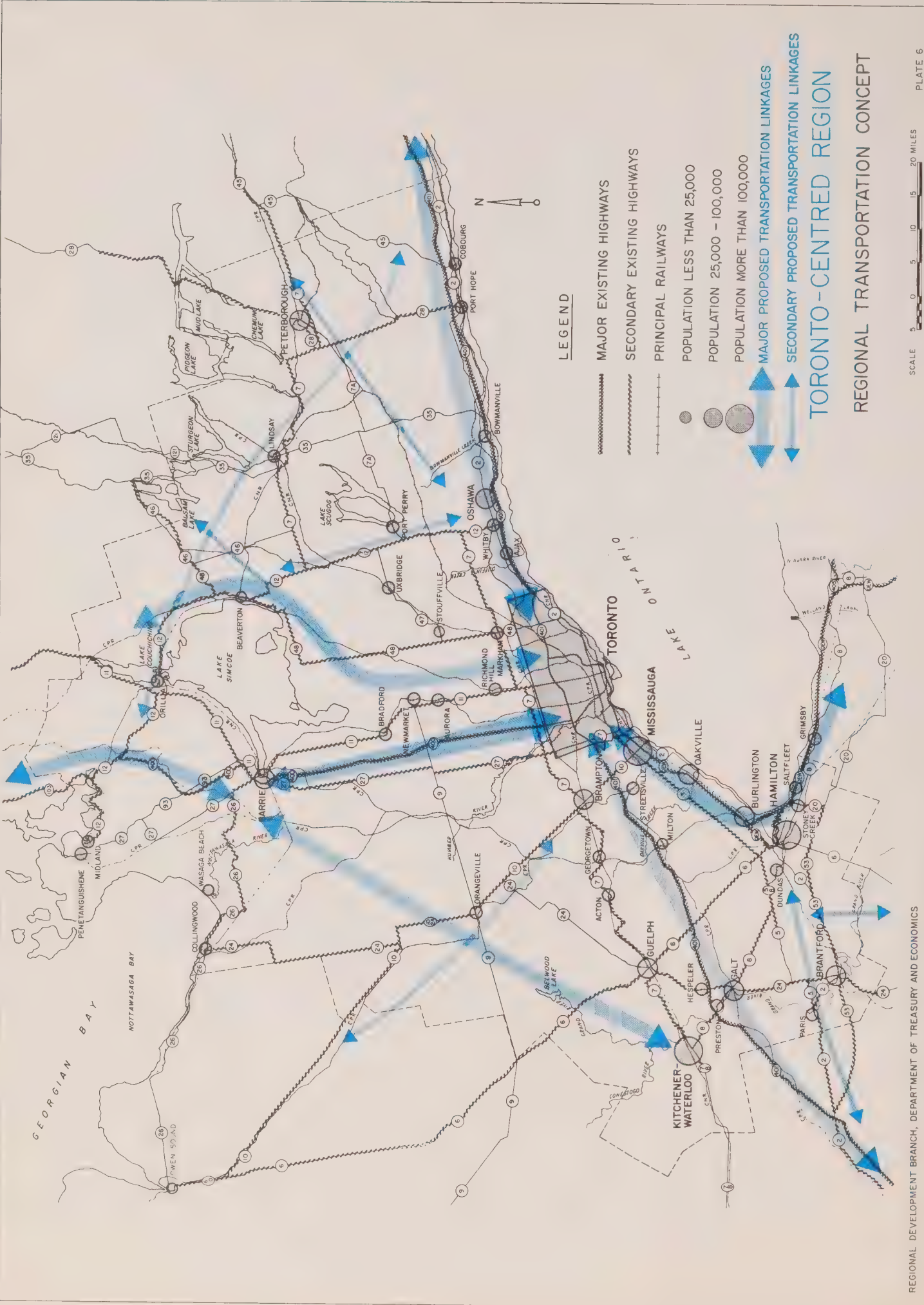
2. Development of a very significant peripheral urban centre in the Port Hope-Cobourg vicinity after 1980.

The reasons for the choice of these two areas are as follows:

1. The problems associated with mass urbanization can be eased by application of the principle of decentralization to encourage centres which are beyond easy commuting range of, but function within, the economic orbit of Metropolitan Toronto.
2. Over-concentration of development within the commuting range (Zones 1 and 2), does not make effective use of the Region's space and resources. Thus, at present, there is an unsatisfactory distribution of population in the Region.
3. The goal of provincial integration of the Toronto-Centred Region into an overall provincial development network would be partially realized. If enlarged, urban centres such as Barrie and Midland could provide closer ties to Northern Ontario. A more dynamic Port Hope-Cobourg nucleus could become a springboard to Eastern Ontario. All of these centres are on major transportation routes and should therefore be attractive to some industrial development.
4. Substantial progress also would be made towards the goal of encouraging each part of the Toronto-Centred Region to achieve its potential. The Georgian Bay Region currently is the least prosperous in the Province, and average incomes in Eastern Ontario also are generally below those of the Province. In contrast, income levels within Metropolitan Toronto and its immediate suburbs are the highest in the Province. Stimulation of key urban centres to the north and east should partially offset these inequities.
5. The North Simcoe and Port Hope-Cobourg districts possess physical capability for large-scale urban development. The provision of water supply and sewage disposal facilities to these urbanized areas can be at a cost comparable with, and possibly cheaper than, costs for similar services in Metropolitan Toronto.

The Western and Southern Periphery:

It is expected that spontaneous growth will occur in the western and southern parts of the peripheral zone, as it will along the western segment of Zone 1. In this respect, the role of the Kitchener-Waterloo-Guelph-Galt complex is expected to be substantial,



but development at present is hampered by shortage of water and sewer facilities. Separate studies are proceeding to define further the roles of this and other urban clusters within the context of the Toronto-Centred Region. Similar development limitations also apply now to the Brantford-Paris district. The roles of these centres now must be re-evaluated, with special consideration to the industrial complex now coming into being along the north shore of Lake Erie.

The Commutershed (Zone 2)

Our policy for the commutershed is to retain it to the maximum degree in recreational, agricultural, and other open space uses. It is expected that, by the year 2000, the percentage of population living in this zone will be 4 per cent, somewhat less than the present 4.5 per cent. In actual numbers, we expect 300,000 people in this zone by the year 2000. The high cost of providing sewer and water services throughout this zone is an important consideration in the decisions to reserve it largely for non-urban uses. Such intensive growth therefore should be deflected into the lakeshore area or the peripheral urbanized areas.

The growth which does take place in Zone 2 will be encouraged into (a) the vicinity of an urban axis which is expected to begin in Zone 1 with Richmond Hill and include Aurora, Newmarket, and to a very small degree, Bradford; (b) such communities as Orangeville, Bolton, Acton, Georgetown, Milton, Uxbridge, Port Perry and Stouffville.

Special care must be taken that the northward access does not predominate as an alternative to growth in the eastern segment of Zone 1. Contiguous strip development along this axis must be prevented by proper planning and by retention of non-urban land between the communities.

Finally, it is important to remember that full-scale development beyond the Lake Ontario watershed will require the pumping of treated sewage effluent back into Lake Ontario to minimize the pollution dangers to Lake Simcoe.

Maintenance of the Georgian Bay Shoreline, Lake Simcoe, Kawartha Lakes, Niagara Escarpment, and Other Special Recreation Areas

The recreation sections of the Region demand special attention because of the high population growth, increasing health and leisure time, and improvements in transpor-

tation. The important goal is to minimize environmental damage while at the same time making effective use of the resources. The Development Concept calls for a more comprehensive recreation plan.

Broadly speaking, in terms of urban development constraints, this guideline recommends moderate growth for Peterborough and Lindsay, which are associated with the Kawartha Lakes; Orillia, which is on Lake Couchiching, and Collingwood, which is on Georgian Bay.

Transportation Policy

Development of the Region's transportation system must reflect the Development Concept. The building of the system must stimulate the Concept's pattern of urban centres as well as the land uses. Up to this point the system has been considered mainly in terms of linkages (see Plate 6). The determination of modes, categories, sizes and levels of service will form part of the Comprehensive Development Plan, yet to be completed.

Land Transportation

- a) The land transportation serving the Lakeshore corridor will require extensive additions and should incorporate all the various transportation modes — highway, rail, air, air-cushioned tracked vehicle, hovercraft, etc.
- b) The existing Highway 400, and the proposed Highway 404, together with the proposed GO Transit extensions north, must be carefully defined to ensure an appropriate pattern. These linkages will assist development of Barrie and Midland, which are in linear extension north of Toronto, improve integration of Northern Ontario with the Metropolitan Toronto area, and increase accessibility of people to the recreation areas outside, especially Lake Simcoe.
- c) A generally linear alignment exists from Midland through Barrie, Orangeville to Kitchener-Waterloo-Guelph-Galt, and Brantford. Direct and improved service will be necessary to stimulate and serve the growth of populations along that alignment.
- d) Midland, Orillia, Lindsay, Peterborough and the centre in the Port Hope-Cobourg vicinity are also in a linear alignment and will also be of sufficient magnitude to require improved interconnecting service (though later and of a lesser magnitude than those mentioned above).

- e) These linkages will assist in the integration of Northern Ontario both with the developed parts of the Province to the south-west of Toronto, and with Eastern Ontario. They will not only aid overall provincial integration but permit by-passing of Metropolitan Toronto for direct traffic.

Water Transportation

- a) The Midland port would connect the Region to the market centres of Chicago and Detroit and may prove to be a valuable asset in the future if Great Lakes shipping experiences a resurgence. It may also act as a collection point for commodities shipped by water.
- b) A port attached to the centre proposed for the vicinity of Port Hope-Cobourg would provide another facility for shipment to ports down the St. Lawrence River and beyond.

Air Transportation

- a) Malton will continue to exert an enormous influence on the shape of the Region.
- b) The location of a new international airport to serve South-western Ontario would be of most crucial significance to the future spatial pattern of the Toronto-Centred Region. An airport will bring it into an immediate impact area, in excess of 120,000 people with public and private investment in excess of \$3 billion. Furthermore, since a new airport will require highly efficient transportation routes between itself and Malton, a new corridor for potential development will be created. The integrity of the Development Concept requires that a site be chosen which does not add such a powerful magnet for development in a location which conflicts with the strategic components of the plan.

Summary

The Design for Development for the Toronto-Centred Region, as for the other regions in Ontario, is based on three fundamental objectives: (1) the encouragement of a more even distribution of people in Ontario, (2) the improvement of the quality of life for these people, and (3) better use of the natural environment. These are the cornerstones of the provincial regional development program. This Report is the first in a series which as a group will provide a concept for the development of all Ontario.

Selected Economic Indicators

Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



Number
Scale A

42
41
40
39

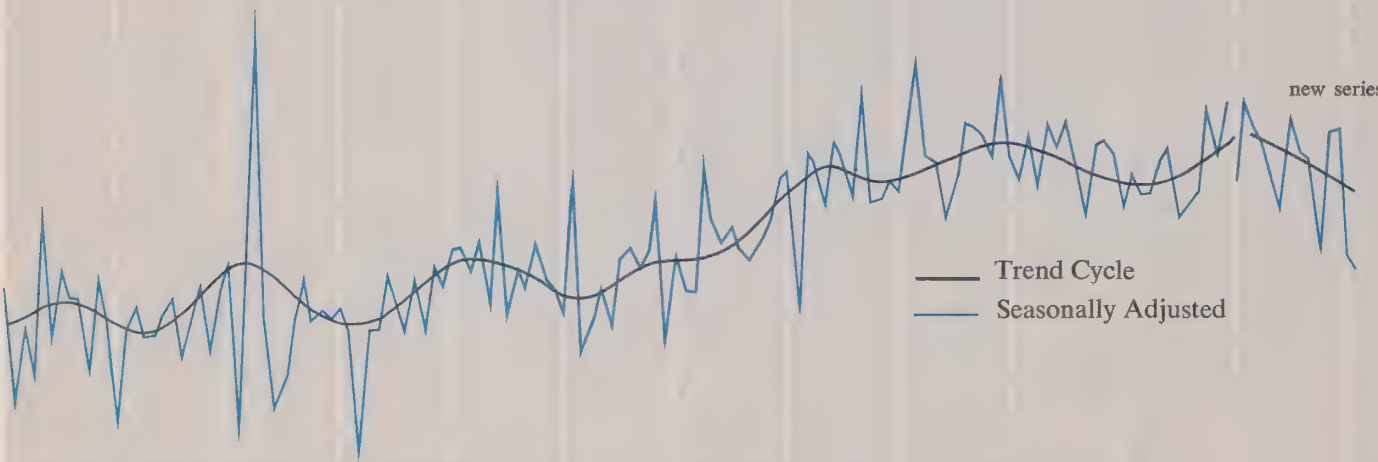
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



\$ Billion
Scale L1

4.0
3.5
3.0
2.5
2.0

Commercial/Institutional and Industrial Construction Contracts, Ontario



\$ Million
Scale L2

200
160
120
100
80
60
40

Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Thousand
Scale L2

100
90
80
70
60
50
40

1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970

Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

Scale L1
\$ Billion
_30
_25
_20
_15
_14
_13



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

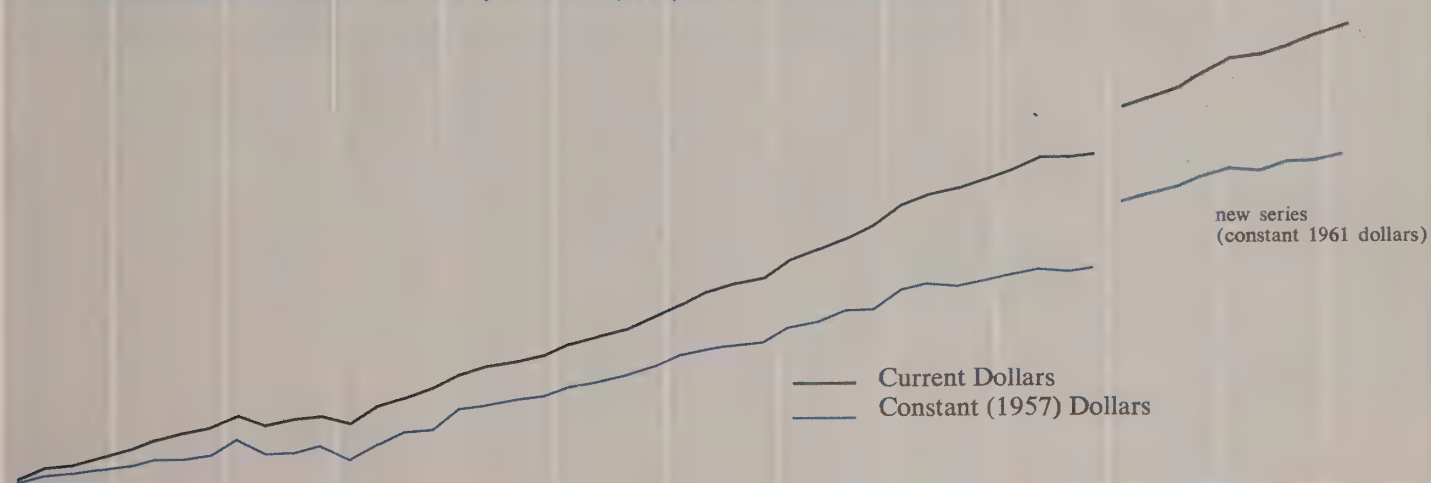
Scale L2
Index
_200
_180
_160
_140
_120
_100



Coincidental and Lagging Indicators

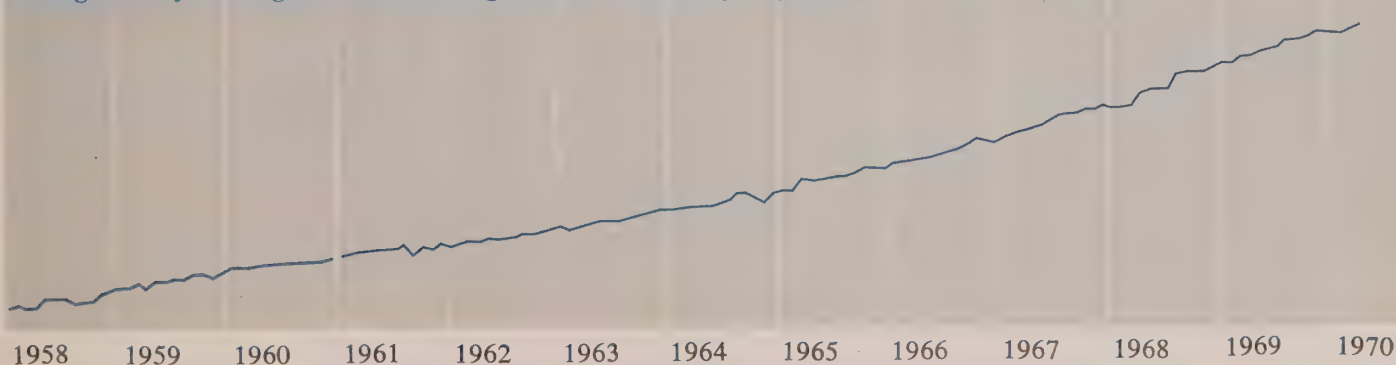
Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

Scale L1
\$ Billion
_80
_70
_60
_50
_40
_35



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Scale L1
Dollars
_3.00
_2.50
_2.00



1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970

Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent

Scale A



Employment, Ontario (Seasonally Adjusted)

Million

Scale L1



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of Labour Force

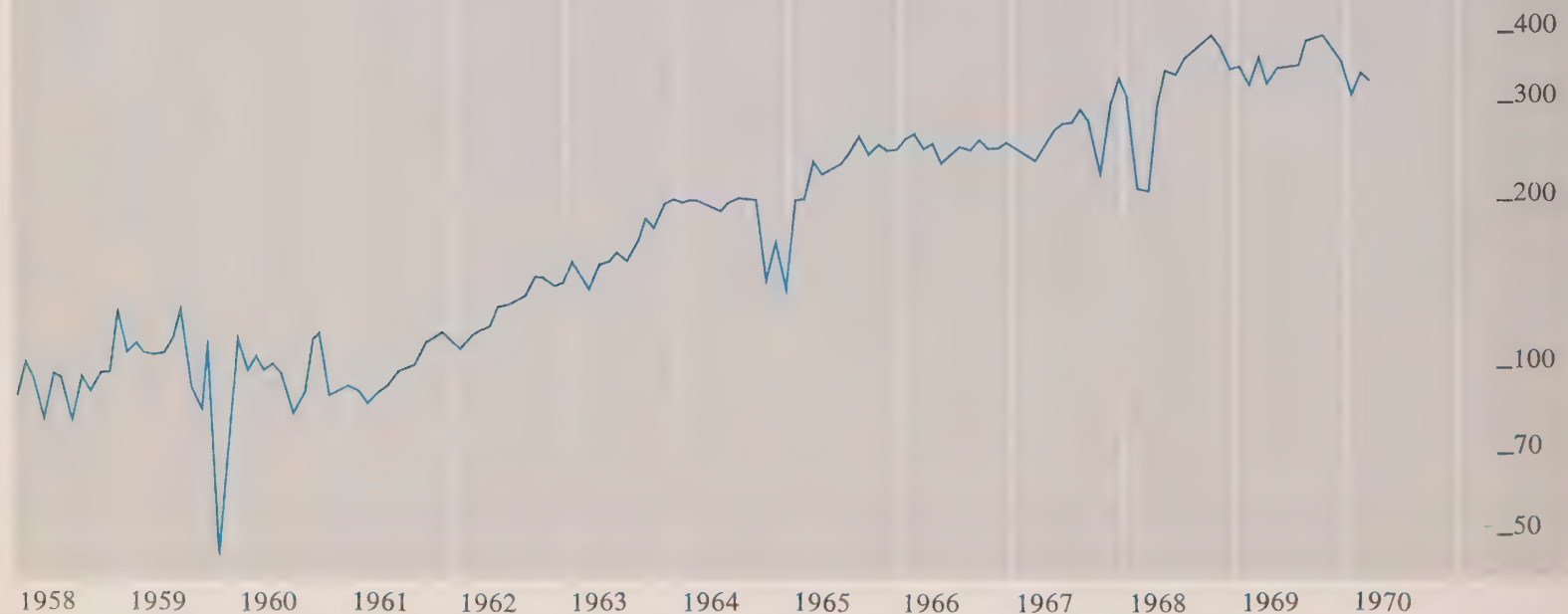
Scale A



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
1961 =
100

Scale L2



Economic Indicators

Seasonally Adjusted

		1969										1970				
		April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	
Leading Indicators																
Average Weekly Hours Worked in Manufacturing	Number	40.1	40.4	40.1	40.2	39.6	40.3	39.9	39.9	38.4	39.6	39.7	39.5	40.0	40.3	
New Orders in Manufacturing Industries ^c	\$ Million	3,539	3,564	3,743	3,741	3,690	3,770	3,634	3,754	3,728	3,662	3,696	3,604	3,662		
Commercial/Institutional and Industrial Construction Contracts	\$ Million	126.1	112.8	93.9	144.0	127.0	123.2	86.6	137.3	140.0	72.1	78.4				
Urban Housing Starts (Annual Rate)	Number	79,900	45,300	63,900	60,800	69,300	67,300	78,300	59,100	64,700	34,800	33,600	55,700	53,900	37,000	
Money Supply ^a	\$ Million	28,331	28,336	28,638	28,324	28,292	28,403	28,472	28,580	28,917	28,955	28,947	28,817	28,966		
TSE Industrial Index ^a	1956 = 100	195.31	197.23	177.34	168.65	175.43	178.15	182.11	187.65	186.37	177.89	183.92	185.17	171.08	154.21	
Business Failures ^a	Number	58	48	35	32	51	52	64	54	53	56	71	82	54	65	
Business Failures — Liabilities ^a	\$ Million	3.2	1.9	2.0	0.9	2.6	4.8	3.4	4.6	2.2	9.9	18.7	4.0	2.2	3.4	
Coincidental and Lagging Indicators																
Gross National Product ^c (Annual Rate)	\$ Million			77,480			79,292			80,888			82,876			
Average Hourly Earnings in Manufacturing	Dollars	2.89	2.92	2.93	2.94	2.97	2.97	2.99	3.02	3.06	3.06	3.05	3.11	3.16	3.19	
3-Month Treasury Bill Rate ^{c,u}	Per Cent	6.80	6.74	7.13	7.62	7.69	7.77	7.60	7.76	7.81	7.78	7.60	7.00	6.78		
Cheques Cashied in Clearing Centres ¹	\$ Million	6,243	6,066	6,152	6,458	6,560	6,570	6,526	6,521	6,240	6,078	6,099	6,661	6,487		
Retail Trade	\$ Million	866	866	875	884	886	901	892	895	909	891	869	884	906	904	
Labour Force	000's	3,038	3,071	3,035	3,028	3,004	3,027	3,035	3,030	3,064	3,044	3,066	3,098	3,111	3,183	
Employed	000's	2,948	2,958	2,926	2,935	2,910	2,932	2,930	2,927	2,957	2,948	2,957	2,981	2,977	3,037	
Unemployed	000's	90	113	109	93	94	95	105	103	107	96	109	117	134	146	
Unemployed as % of Labour Force	Per Cent	3.0	3.7	3.6	3.1	3.1	3.1	3.4	3.4	3.5	3.2	3.6	3.8	4.3	4.6	
Wages and Salaries	\$ Million	1,271	1,288	1,295	1,318	1,303	1,312	1,318	1,336	1,347						
Index of Industrial Employment	1961 = 100	131.4	131.4	131.0	129.6	129.3	129.6	130.7	132.7	132.8	132.1	133.0	132.7	132.1	131.4	
Index of Industrial Production ^c	1961 = 100	167.7	167.0	167.1	166.8	164.5	165.9	165.6	169.3	172.0	171.1	174.4	171.5	172.5	171.1	
Total Manufacturing ^c		167.3	168.5	169.0	169.3	166.5	166.8	166.7	169.5	170.7	167.8	171.0	168.1	170.1	168.1	
Non-Durables ^c		150.2	150.6	151.1	151.6	152.5	153.0	152.4	153.4	154.3	152.3	154.3	152.8	154.7	155.6	
Durables ^c		188.2	190.3	190.8	191.0	183.7	183.8	184.1	189.2	190.7	186.8	191.4	186.7	189.0	183.4	
Mining ^c		155.7	145.5	142.6	138.9	136.2	141.8	140.3	151.8	163.4	170.2	175.7	170.6	164.0	167.4	
Electric Power and Gas Utilities ^c		186.2	186.1	187.1	189.0	190.1	194.6	195.5	194.6	197.0	201.0	203.0	203.0	206.4	203.4	
Primary Energy Demand (Annual Rate)	BKWH	59.20	58.54	59.12	60.28	58.83	58.39	59.09	59.56	63.13	64.53	63.91	62.94	63.39	61.60	
Exports (including re-exports) ^c	\$ Million	1,194.2	1,233.6	1,212.5	1,196.0	1,161.7	1,293.4	1,283.0	1,285.0	1,328.9	1,447.0	1,402.1	1,410.0	1,438.7	1,435.0	
Imports ^c	\$ Million	1,149.3	1,166.6	1,215.2	1,124.2	1,136.3	1,220.1	1,206.7	1,223.2	1,215.0	1,116.8	1,230.6	1,242.0	1,185.3	1,211.0	
Unclassified Indicators																
Foreign Exchange Reserves ^{c,u}	U.S. \$ Million	2,782	2,760	2,623	2,565	2,594	2,539	2,629	2,613	2,616	2,698	2,777	2,936	3,179		
Industrial Materials Price Index ^{c,u}	1935-39 = 100	267.7	271.8	270.6	270.5	269.2	270.4	266.8	267.8	271.5	272.3	272.3	275.7	274.4	275.4	
Consumer Price Index ^{c,u}	1961 = 100	124.6	124.9	125.9	126.4	126.9	126.6	126.8	127.4	127.9	128.2	128.7	128.9	129.7	129.6	

^aStatistics for Canada.

^bNot seasonally adjusted.

¹Ontario less Toronto.



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Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister



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The Possible Uses and Limitations of Planning

L. Bodnar, *Economist*

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Geocoding—A Technique in the Development of Urban Information Systems

E. Weatherhead, *Statistician*

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Selected Economic Indicators

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Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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About The Review

The feature article for the September/October edition of the *Ontario Economic Review* examines Geocoding — a geographically referenced data storage and retrieval system which emphasizes provision of data on larger urban centres by specified areas.

The rapid growth and constant change of urban areas in recent decades has led to a recognition that future growth will have to be better regulated if we are to maintain our cities as desirable living entities. At present there is a great need for small-area data which are timely and accurate and which reflect the changing levels of urban activity. Geocoding is intended to provide a larger quantity of better quality data which can be more quickly obtained, easily understood and correctly used.

Mr. Weatherhead is a statistician with the Ontario Statistical Centre, Economic and Statistical Services Division, Department of Treasury and Economics. The author wishes to acknowledge Mr. Robert Ion and Mr. Harold Goldstein, as much of the material in this paper is based on their articles; respectively, "The Geographic Basis of the DBS Geocoding System for Urban Areas: An Overview", December 1969, and "The Urban Information System: Some Concepts, Issues and Experiences", May 1969.

In a short article on the uses and limitations of planning, Mr. L. Bodnar of the Economic Planning Branch, Department of Treasury and Economics outlines some aspects of the role and inter-relationship of the professional planner, the politician and the general public in the field of planning. Emphasis is also placed on the proposition that planning is a technical tool to be used in the rational allocation of resources and should not be considered as a threat to personal freedom.

Indicator Charts, Pages 13-15

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 13-15 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

The Possible Uses and Limitations of Planning

L. Bodnar, *Economist*

Department of Treasury and Economics

Introduction

Governments as well as private firms are becoming increasingly aware of the need to examine systematically the implications of their policies and to devise plans or strategies to reach their objectives promptly and efficiently. Plans serve the *future* but involve *present* decisions, as well as future ones. Governments, for example, must make decisions to allocate resources among such areas as highways, medical and health services, educational facilities, housing and recreation and numerous other matters. It is essential, therefore, that rational, scientific methods be applied in assessing future requirements, in allocating resources and in reviewing the validity of the assumptions and methods applied in the process of policy-making. In Myrdal's formulation:

"coordination leads to planning, or rather, it is planning as this term has come to be understood in the Western world. Coordination of measures of intervention implies a reconsideration of them all from the point of view of how they combine to serve the development goals of the entire national community, as these goals become determined by the political process that provides the basis of power.¹

The growing importance of planning is indicative of the tendency for public policy matters to become increasingly concerned with strategies aimed at maximizing overall welfare while not reducing any individual's well-being. This concern with the future, combined with revolutionary changes in technology which have made possible the attainment of a wide range of welfare goals, has led to a great increase in the importance of planning.

Planning is frequently defined as a process by which one attempts to influence the course of future events in order to achieve selected goals. It is necessary, however, to add that goals are dynamic rather than static. Therefore, the planning process must be flexible enough to enable the planner to modify both the chosen goals and the means of achieving them.

This article will deal with some selected aspects of planning rather than the subject as a whole. The two main topics to be considered are:

1. the role and the inter-relationship of the professional planner, the politician and the general public in the field of planning;

2. the proposition that planning is nothing more than a technical tool to be used in the rational allocation of resources rather than a threat to personal freedom.

The Language of Science

As a result of an increasing awareness of the value of the scientific method, it can be expected that modern society will attempt to follow a scientific approach in the search for solutions to the everyday problems that confront it. Planning — as applied today in North America — is based on a combination of empirical knowledge, stated objectives and the application of logical methods to achieve these objectives. Thus planning, by definition, is a scientific method, the application of which enables us to attain our objectives in the most efficient manner.

However, in the use of the scientific method we are faced with a serious problem which has, in some cases, discredited the entire approach. This problem is the use of a jargon by the technician who finds special words or word meanings very helpful in his work. For the layman, this jargon is mystifying. Accordingly, unless the planner translates his findings and proposals into ordinary language he runs the risk of being misunderstood and having his ideas rejected.

Model Building

The indiscriminate application of mathematical models to evaluate programs represents another serious problem. In many instances, models are expected to provide the complete cure for all socio-economic ills, rather than function as an analytical tool to be used by the professional.

A look at the following steps used in the development of a planning model may help to demonstrate its capacities and limitations:

1. The specification of a theoretical model;
2. Testing the validity of the theoretical model;
3. Examination of the divergence between the model and reality.

In a model one simplifies reality in order to help develop an understanding of a complicated real-life situation. It is also important that we realize a model is only useful to the extent that it is relevant and effectively represents things as they really are. The empirical inputs of a model are thus of overriding importance. However, it is unnecessary and frequently undesirable for a model to completely reflect every aspect of the situa-

tion it is designed to represent. All that is required is that the model portray accurately the effect of policy changes on the selected interrelated variables.

This combination of the abstract model and direct human judgment based on empirical observation will only provide an approximation of the actual events. Thus, the output of the model should be used only as a yardstick. The validity of the model should be tested continuously, the test consisting of a comparison between the results obtained from the use of the model and observations from real life. If the divergence is too great, the model should be modified appropriately.

Naturally, in a dynamic situation the points of reference and their relationships are continually changing, and thus there is a constant need for checking the relevance of the theoretical planning model against the points of reference in the *real* world.

Unfortunately, the general public has become sceptical and even apprehensive about the use of models; once again, because of the misuse of some models, such suspicions are often justified.

Technocrats — Politicians — Public

In elaborating development plans, one of the major theoretical problems encountered is the definition of some objective measure of priorities.

When we try to answer the questions, "What is the good life?", "What is the objective hierarchy of values?", or simply, what is the 'real' meaning of the phrase, "first things first", we are faced with profound semantic and philosophical problems.

As these all-encompassing criteria are not yet available, countless and endless discussions deal with; "the quantification of social welfare functions", "the objective trade-off between pollution and better justice" or "the nature of the public good". In the midst of these discussions the public is becoming increasingly disoriented and sceptical.

Once again the professionals have only themselves to blame. When, in a democratic society, one is working in an area as sensitive as planning, scrupulous attention must be paid to the effect on the public of each pronouncement on the topic. Even though it is difficult to develop programs that satisfy all members of the community, public discussion on the subject is essential both for the information of the planner and the education of the community; it is at this point that the

¹Gunnar Myrdal, *Beyond the Welfare State* (New Haven: Yale University Press, 1960).

role of the politician is vital. In the ideal sequence of events, the planner obtains as much information as is available on a series of alternative programs. He then presents this information in a coherent and intelligible form to the politician, and the politician, as the representative of the public, decides among the alternatives. In this way, to the extent that the politician is in close touch with his constituents, an acceptable system of priorities is established.

Minimum Levels of Performance

Although a complete specification of the needs of a community is impossible, many practical difficulties concerning planning can be significantly reduced by identifying minimum or mandatory levels of performance of social services as opposed to higher levels of performance that may, if they are of interest to the community, be negotiated at a later date.

The minimum level of performance for a social service at any particular time is established by taking into account maintenance of the present level of performance of that public service, expanding only in response to growth of the population.

To these minimum levels of service, cost-effectiveness criteria should be applied to secure the optimum allocation of available resources. Higher population and higher industrial output tend to increase the public expenditures required to maintain the minimum level of services. It is interesting to note at this point that, according to the economic and political philosopher Bertrand de Jouvenel, "a most moderate program in this respect (the field of social investment) implies that public spending for this objective should be multiplied eight times in 25 years, while the sum of personal incomes would be multiplied by three times and income per head two-and-a-half times."²

Estimation of the expenditure required for a minimum level of performance of public services involves the application of technoeconomic coefficients which indicate the resources necessary to provide the expected level of social service. There may, of course, be a number of alternative solutions in both technical and financial terms to achieve the same level of performance for a particular social service. It is necessary that decision-makers select the most appropriate alternative. For this purpose, they must have all of the available information.

Negotiated Levels of Performance

As a result of cultural change, increased urbanization, technical progress, etc., a society may become dissatisfied with the existing levels of performance of services. This requires the development of "higher" or negotiated levels of performance of public services as objectives for the community.

The question then arises as to how to objectively measure the satisfaction brought by these enhanced levels of performance. Can or should a uniform criterion be established in this respect? It is doubtful. The allocation of public funds will depend in general on the pressures exerted by the proponents of the different sets of objectives. That is to say, the extent to which the public (represented and persuaded by politicians) is willing to accept further burdens which may mean the curtailment of personal choices in favour of enhancing the scale and variety of public alternatives.

Attempts can be (and are) made to quantify in financial terms the benefits obtained from these additional social services. Attempts have also been made to find an objective measure of the trade-off values between the alternative uses of public funds. However, the very nature of these negotiated performance levels may defy quantification of this kind. They correspond to value judgments and involve group interests. All these factors are a part of the human condition and reflect the scale and variety of choices, but through the mediation of the politicians, the public's wishes can be made known.

Planning as a Tool

Planning, by itself, does not set objectives, does not limit choice nor restrict personal freedom. Planning is a rational method of coordinating the allocation of resources for future developments. It may, in fact, have as its immediate objective the opening up of new options, thereby enhancing the multiplicity of choice. Comprehensive land-use plans, for example, can save valuable farm lands for agriculture while providing adequate residential areas and outdoor recreational facilities. Just imagine how planning could have improved the water of our lakes and rivers, the air we breathe, our cities!

Plans may be designed to meet negotiated requirements or — as another extreme — could deal exclusively with minimum requirements for public services. In Western societies, the planning process usually contains

both minimum and negotiated components. The boundaries between these two levels of performance are themselves subject to change over time. Once a negotiated level of performance has been accepted and incorporated into the public expenditures, it then tends to be considered as non-negotiable, and in fact, becomes the new minimum. However, these previously negotiated levels of performance continue to represent a secondary layer above the hard-core, basic requirements for social services and could in extreme circumstances be totally or partially removed as a result of political change.

Planning does not in any way set policy; its only function is to provide a strategy whereby a community may attain certain objectives. To the extent that the planning is employed successfully, a community uses fewer resources and spends less time achieving its objectives than it would without a plan. The particular relevance of planning to the present day situation is that the problems of the world are becoming progressively more severe. High living standards and rapid population growth combined with increasing technological change all require the husbanding of resources on an unprecedented scale. We can no longer afford to live as though our environment were limitless. It is now necessary to plan so that we use our resources in the best way possible.

Unfortunately, in the past this was not done, and we are now suffering the consequences. We are now burdened with the task of suppressing the effects of retained pesticides, disposing of nuclear wastes and eliminating water and atmospheric pollution in plant and animal tissues. In addition, because of a lack of foresight in the past, we must now put up with regulatory measures resulting from the conflicting demands on our resources.

This situation will likely persist if we continue to regard economic growth as a good thing in itself. We are now having to pay for our growing abundance of material goods with increasing environmental discomfort and anxiety. As a result, the number of people insisting on the need to change our life-style and value system is increasing. Thus it is vital that attempts to improve the quality of life be based on comprehensive, technically efficient planning activities.

Summary and Conclusions

The submission of any proposed plan to the cabinet, parliament and the public has to be

²*The Technocratic Age*, Bulletin of the Atomic Scientists. V.20, 1964.

more than a ritual. It is a vitally important step which serves to check the validity of the assumptions and the feasibility of attaining the stated and implicit objectives of the proposed plan.

Public discussions of a plan are particularly important when alternative proposals to meet requirements for public services could significantly influence the lives of a great number of people. It is exactly these controversies that can give the people a chance to influence decisions regarding their own future.

The democratic decision-making process implies the active participation by well-informed citizens. However, the growth of technology has decreased the individual's share of the knowable, resulting in an increasing gap between the knowledge of the expert and the understanding of the public. This is

one of the reasons why the public is becoming increasingly disoriented and indifferent in issues which are vitally important.

Specific points that must be kept in mind are the following:

1. In order to provide the public with an opportunity to understand special technological problems, specialists should use the simplest possible language in explaining their proposals.
2. In our society, planning, concerned with strategies aimed at satisfying a number of (minimum and negotiated) requirements, is becoming increasingly important. However, we have to realize that planning models are logical tools only. Their usefulness depends on their validity and the validity of the models must be tested against reality on a continuing

basis. Consequently, technocrats, politicians and the public must work together in planning.

3. The fulfilment of basic, minimum requirements assures the survival of man as a social being, but a multiplicity of choices assures the survival of man as an individual.
4. Once the community has set its own objectives, it is the planners' task to ensure that these objectives are attained promptly and economically.
5. To make this whole process workable, all citizens should be informed as to the effects that change has on a society. Only in this way can all citizens make meaningful contributions to a democratic planning process.

Geocoding—A Technique in the Development of Urban Information Systems

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The Information Problem

The rapid growth and almost unbelievable change that urban areas have experienced in recent decades has led, slowly but surely, to recognition that future growth will have to be better regulated if we are to maintain our cities as desirable living entities.

Realistically, this cannot be adequately done unless we are in a position to readily identify problem areas, pressing needs and issues relevant to proper development. Knowledge of existing conditions, in terms of people, property, and metropolitan structure is essential. Our present knowledge is not adequate.

The problems of providing information necessary for effective decision-making within cities are unique. Cities rely, to a large degree, upon data generated at provincial and federal levels which are not, generally, adequate for their needs. Cities have a great need for small-area data which are timely and accurate and which reflect their always-changing level of activity. This need is not met today.

The decennial census of population and housing provides extensive information about the urban environment, but in rapidly changing areas this information quickly becomes obsolete. Studies aimed at pressing problems have gathered data on a 'one shot' basis, but generally fail to provide the means for regular supplementation of this data.

It is an unfortunate fact that many vital public decisions are made without access to current and comprehensive data on the urban environment. Often, the relevant problems cannot be properly defined or even recognized due to the inadequacies of the data and the constraints imposed by agency considerations, an approach which limits the comprehensive perspective.

Growing Technology

Recent advances in electronic data processing have made it possible to consider the development of systems to cope with the above problems. The advent of the large-scale computer has, in some cases, multiplied by factors of a thousand the capability for developing and maintaining large data files. Program options, which previously have not been feasible, are now a reality and the development of both hardware and software has now reached the point where large-scale computers can be realistically utilized to put the information problem in order.

Unco-ordinated Approach

Unfortunately, governmental collection and development of information has reached its present status in an 'ad hoc' fashion. Much data is gathered by public agencies in the course of their normal activities. Each agency, however, is interested only in the specific data it needs for its own particular operational responsibilities. There is little attempt at interagency communication, to discover if the data needed already exists, or to ascertain whether another agency needs data which can be easily collected, at minimal extra cost, during the course of a proposed survey. A comprehensive view is nonexistent.

The resultant chaotic situation is unfortunate. Data are collected and coded without proper regard to methods and procedures developed elsewhere. Consequently, it is not difficult to understand the sources for the incompatibility of existing material.

The Nature of the Need for a Planning Information System

The nature of the need for data on a small area basis was emphasized by the 1966 census which showed that nearly one-half of Canada's population at that time — some 9.7 million people — were living in 19 metropolitan areas. Moreover, the Economic Council of Canada has estimated that well over 80 per cent of the 25 million population it forecasts for Canada in 1980 will live in urban areas — and that about 40 per cent of these urban dwellers will live in the Montreal, Toronto, Vancouver, Winnipeg, Calgary, Edmonton and Ottawa regions alone.

The rapid advancement in data processing technology and statistical methodology together with the expansion of statistical needs by economists and other data users has rendered former methods of collecting, organizing and disseminating data inefficient and obsolete. Complete utilization of data currently being gathered at great cost and inconvenience is being thwarted by the application of inflexible and incompatible geographic and other standards, which prevent the convenient manipulation and integration of data. Consequently, there is an urgent need for new methods of assembling and providing data for policy planning and analysis. Geocoding is intended to provide improvements in efficiency by allowing the integration of various kinds of data for any specified area. This procedure should provide a larger quantity of better quality data which can be

more quickly obtained, easily understood, and correctly used.

The System — Geocoding

In response to the need, the Dominion Bureau of Statistics has under development a computerized system for providing 1971 census data for large urban areas on a user-specified basis.

It is envisaged that the system will eventually make available any combination of census or other data for virtually any area that the user might specify (within minimal limitations). The main objective is to provide tabulations relatively quickly and inexpensively by automatic selection and aggregation of a series of building blocks that make up the area specified by the user. In the larger urban areas these would be city block-faces; enumeration areas will be used elsewhere. The service will be made possible by the automatic precoding of all census addresses.

Eventually, diverse socio-economic statistics from other surveys could become available on a similar basis, with cross-tabulations in a variety of combinations.

This Geographically Referenced Data Storage and Retrieval System (GRDSR), more commonly called Geocoding, emphasizes provision of data on larger urban centres by areas specified by the user, as opposed to present standards, such as, enumeration areas, census tracts, and municipalities (for which census data will continue to be provided).

The system consists of a set of data processing operations and the storage and retrieval of the corresponding data on randomly accessible data storage devices. It provides flexibility for the retrieval and tabulation of any combination of census data and for cross-referencing of different data files by any specified area (provided that the confidentiality requirements of the Statistics Act are safeguarded).¹

Conceptual Aspects

Geocoding is a refined technique of geographically coding addresses by assigning to each of them, through a computer process, x, y co-ordinate values. The system is based on the fact that most surveys or pieces of information have common reference points — the addresses of respondents.

On this basis, once a survey is taken, the data obtained from each respondent is attached to his address, which can be converted to a machine readable form. Then the

¹Dominion Bureau of Statistics, *Geocoding — Facts by Small Areas, Ottawa, 1968*

appropriate geographical co-ordinates, as referenced in the *Universal Transverse Mercator System*, are attached to the address.

Address Conversion File – Concept

A necessary tool for the referencing of information to areal units is the Address Conversion File (ACF). The ACF is a listing from the area of all block-faces (generally one side of a street separated by consecutive intersections) by:

- (a) block-face terminal addresses;
- (b) street names;
- (c) block-face centroid co-ordinates.

As an essential working machine readable file, the ACF must be kept constantly up to date as to changes of addresses, changes in street names, and all other pertinent data.

A graphic and tabular representation of the ACF is given in Table 1 and Figure 1.

The work required for establishing an Address Conversion File represents a major effort at the present time. It is estimated that the preparation of a conversion file for a city

of one million people currently would take three clerical man-years work. It is very likely, however, that this time will be halved by improved system design, methodology and on-the-job experience. The creation of the conversion file requires:

1. The selection of an accurate map of the municipality;
2. The updating of it;
3. Preparation and keypunching of a street index;
4. The digitization of strategic points along all streets representing beginnings, ends, intersections, and changes in direction;
5. The preparation, coding and keypunching of address ranges by block-face;
6. The input data must be edited, verified, and processed by computer;
7. Block-face centre points are calculated and the address conversion file is produced.²

A by-product of the operation is a plotted street map for the municipality. Figure 2, page seven is an example of a computer printed map.

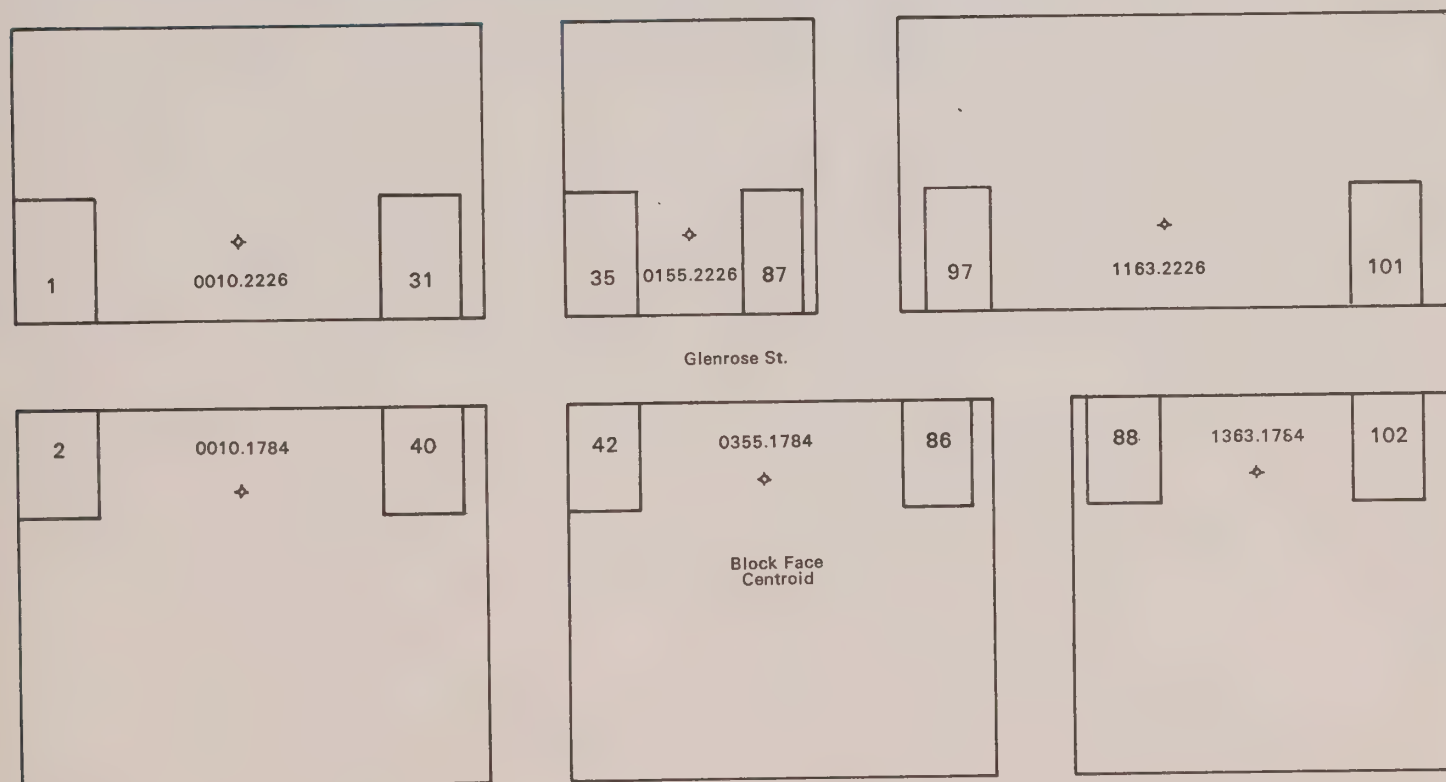
Table 1 – Tabular Representation of Address Conversion File

Street Name	Block Face Address Ranges		Block Face Centroid X.Y
Glenrose St.	1	31	0010.2226
Glenrose St.	35	87	0155.2226
Glenrose St.	97	101	1163.2226
Glenrose St.	2	40	0010.1784
Glenrose St.	42	86	0355.1784
Glenrose St.	88	102	1363.1784

Defining the Query Area

Using the block-faces as units, the urban user can define his own specific study area simply by outlining the block-face within the desired area. This may be done, and preferably should be done, on a computer-printed map which DBS proposes to supply.

Figure 1 – Address Conversion File – A Graphic Illustration



²J. I. Weldon and I. P. Fellegi, Computer Methods for Geographical Coding and Retrieval of Data in the Dominion Bureau of Statistics, DBS, Ottawa.

Areas may be enclosed by streets, or by other well-defined boundaries, may cut across boundary lines of census tracts or enumeration areas (in urban applications) but may not cut across block-faces. Thus, the user has considerable flexibility in areal delineation and almost unlimited practical possibilities are opened up for users whose interests are essentially small area in nature. Typical of areas that could be studied under the GRDSR system are school districts, town planning districts, traffic zones, product testing, and marketing zones.

It should be emphasized again at this point that the confidentiality requirements of the Statistics Act prohibit disclosure of information on individuals or individual bodies. Therefore the user should not expect to receive data for individual block-faces or even city blocks. However, the benefits of the system far outweigh this constraint.³

Storage and Retrieval

Once geocoded, data for individual records are stored as strings — each string recording the information for one data characteristic of the population reported.

Information in each string will be arranged as to:

- (a) Individuals within households;
- (b) Households within block-faces;
- (c) Block-faces within the urban geocoded area.

There are as many data strings as there are data characteristics recorded. While the design of the strings assures maximum efficiency in retrieval and cross-tabulation, the required data strings and the portions corresponding to the designated retrieval area are accessed through the block-face centroids.

By storing data in this fashion, it is anticipated that retrieval will be a relatively simple operation.

In the initial step, the user will specify the exact data characteristics, the precise variables for these characteristics (age, sex, income, ethnic origin, etc.) and the boundaries of the requested area. Computer processing will then select all the block-face centroids which lie within the area. From this point, a generalized program will retrieve and tabulate requested data fields bearing the selected block-face identifications. No programming work will be required on the part of the user, nor any knowledge of computer programming.

Scope and Limitations

Geocoding urban areas requires a large initial supply of street input information, such as, accurate street maps and up-to-date address ranges — and this information must be constantly updated.

Since this information must be coded for computer processing, there are obvious limits on the number of urban areas that can be geocoded by DBS for the 1971 census. Present objectives call for processing those areas that had a city-proper population in 1966 of at least 100,000 — providing also that there are local agencies in these areas that are prepared to supply and periodically update the required street input information.⁴

Activities in Ontario

Recognizing the importance of geocoding for urban analysis and policy planning, a team from the Ontario Government, comprised of members of the Department of Treasury and Economics and the Department of Highways has been formed to investigate the possibility of applying geocoding techniques to projects in Ontario. To further assess the need for and usefulness of geocoding within the Ontario Government, a seminar on geocoding sponsored by the Ontario Statistical Centre was held in September 1970. The seminar was a part of the research work and general activities conducted by the Ontario Statistical Centre in the area of geocoding.

GEOCODING — A TECHNICAL VIEW

The prime concept of the Dominion Bureau of Statistics Geocoding System can be examined with a view to underlining the importance of the system's spatial framework in the attainment of its objective; namely, tabulation of data by 'ad hoc' areas specified by the users.

The three main elements of the spatial framework are:

1. The block-face;
2. the address range of each block-face;
3. the geographic co-ordinates of each block-face.

The Basic Concept

In order to furnish users with data for small areas specified by them on an 'ad hoc' basis, a spatial framework is required, composed of primary areal units to which data can be referenced or coded (hence 'geocoding'), and from which, in aggregation, the query areas

of data users can be constructed. Although the specific properties of the primary areal units will vary according to the spatial framework and system adopted, there are at least three significant characteristics that they must exhibit in a computerized system designed to retrieve data for user-specified areas: (i) they must be small enough to function as building blocks; (ii) they must be identifiable by a code; and (iii) the location of each one must be unique and specific within an ordered spatial universe.

In urban areas DBS has approached the geographical referencing of data to primary areal units by means of a concept known generally as 'street address conversion'⁵. The logic behind street address conversion as a technique for geographical referencing is as follows: The statistical population for which data are collected may be identified in urban areas by an address (specifically a civic, i.e., municipal, house number form of address, such as 1210 Carling Avenue, Ottawa, Ontario). Addresses are pre-grouped conveniently, in most cases, into address ranges for block-faces⁶ of city streets. A block-face is a meaningful areal unit to planners, administrators and researchers in general, and it is usually small enough that it could serve as the primary areal unit of a spatial framework. However, block-faces, while they may be a readily identifiable and discernible element of the street pattern, are not provided with a location-specific identification (i.e., an unique x, y co-ordinate value) on the basis of their address ranges alone. The street name and address of a data observation do not describe the absolute location of the observation within an 'ordered' spatial framework, nor do they indicate relative location with respect to all other data observations.

⁵The street address conversion concept was introduced to the Dominion Bureau of Statistics by members of the Urban Data Centre, University of Washington, Seattle. For the detailed development of the concept see Dial, 1964; Calkins, 1965; Crawford Jr., 1967.

⁶The term 'block-face' is used to designate one side of a street between neighbouring or consecutive intersections. The block-face constitutes the primary areal unit of the system's spatial framework, though on occasion it may be split either to respect the presence of a statistical area boundary or to retain some semblance of an optimum size. 'Address ranges' referred to in this study are the terminal civic house numbers for each block-face or split block-face. Their values are such that they enclose all individual civic house numbers in the primary areal unit.

³Dominion Bureau of Statistics, *op.cit.*

⁴*ibid.*

Centroids at 800 Scale
Created Apr. 15, 1970

Options Specified

- Scale = 0800 ft/in
Features = Name
Street Signs Not Plotted
Street Directions Not Plotted
Centroid Plotted
No Address Ranges



In order for block-faces to function as primary areal units within an automated spatial information system, they must each be provided with a location-specific identification. This latter step is achieved by relating the nominal grid to a geographic grid system, (Transverse Mercator Grid System).

Block-faces may be represented by a point, the location of which in two-dimensional space is expressable as a set of co-ordinate values (x,y) within a geographic grid system. The co-ordinate identification of this point location is unique within the zone of the geographic grid system. The point that is chosen is the mid-point of the long axis of the block-face set back from the street centre line a prescribed distance. This mid-point is termed the block-face 'centroid'.⁷ The co-ordinate values for the centroid of the block-face can be used as a code and assigned to each data observation occurring on the block-face, thus identifying the data and simultaneously placing it in an ordered spatial framework. This process is known as creating an Area Master File.

A 'conversion' can be effected between the nominal grid⁸ elements (street name and address range by block-face) and the geographic grid⁹ element (the centroid of the block-face expressed in co-ordinates). Data bearing a street address identification can be tested by computer against a file of address ranges and corresponding centroid values. Once the appropriate address range has been found for the address in question, its centroid value can be substituted for the data's street address, and the data can be stored on the basis of this newly acquired identification. Geographical referencing or geocoding will then have been accomplished. The process is known as creating an Address Conversion File.

Spatial Framework

The basic elements of the geographic framework of a street address conversion system are derived from the urban landscape and a geographic grid system. Only those features that would be vital to the development of a spatial framework for the referencing of data, and that would provide attendant plotting and graphic capabilities are abstracted from the urban landscape. It is with reference to these features that the term 'nominal grid' is used in this study. They may be classified as features of the street pattern and as non-street features, such as rivers, railways and area boundaries.

Street Name	Block-face address range	Co-ordinates of block-face mid-point (centroid)		
		(X)	(Y)	(Zone)
Adam St.	1-19	481,209	4,896,212	12
	2-18	481,217	4,896,180	12
... etc.				

The spatial framework for the geographic referencing of data is arrived at through the street pattern¹⁰. There are two basic elements: (i) portions of streets known as block-face; and (ii) street address ranges for each of these. The nominal grid and the geographic grid are brought together by recording the mid-point or centroid of each block-face in terms of the co-ordinates of the geographic grid and relating all elements in a single address conversion file. See example above.

The centroid code assigned to data observations by means of an address conversion file is the fundamental element of the automated system of geographic referencing of data for subsequent storage and retrieval.

Plotting and Graphic Capabilities

The nominal grid lends itself to representation in a machine-processable form for both street features and non-street features which, when defined in terms of the geographic grid, permit automated map plotting and computer mapping. An example of computer mapping is shown in Figure 2. Each street feature and non-street feature, identified by name, is coded as a string of points or 'nodes' that sequentially represent terminals, intersections with other features and abrupt changes of direction. Once associated with a geographic grid co-ordinate, each node has a location-specific identification that places it uniquely within an ordered spatial universe and in relative position to all other points described therein. Automatic plotting of features is achieved by connecting node strings by straight lines on the basis of the node co-ordinate values.

The co-ordinate location of centroids is calculated from the geographic co-ordinate values of the nodes that define the block-face; thus, both the establishment of the spatial framework (primary areal units, address ranges, centroids) and the definition of features are achieved by means of a mutual process.

The suitability of the geocoding system for general street mapping by computer at any

specified scale has been demonstrated in program development. The geocoded data base also lends itself to line-printed and more sophisticated computer mapping routines.

The Block-Face

The block-face is one of two basic elements of the nominal grid; the other being the address range. Earlier in this article, the block-face was identified as the primary areal unit of the spatial framework. Defined in this way, it is understandable that this unit has also been considered as the basic 'building block' of the system, whereby through aggregation, specified areas may be constructed. However, conceptually, the block-face is not so much the building block of the system as is the 'address range'. Two basic functions of the block-face then become: physically containing the address range building block, and providing a convenient mental image or frame of reference with which the address range can be associated. Later in this paper, the repercussions of choosing the block-face as the primary areal unit will be discussed in the context of data retrieval.

The block-face is perhaps most characterized by its lack of standardization. In this respect it is not, at first glance, a very satisfying prospect as the primary areal unit of a spatial framework. However, block-faces are

⁷The 'centroid' is a point location situated at the mid-point of a block-face (or any other primary areal unit) and recessed a standard distance from the street centre line. Its co-ordinate values serve as both a code attributable to all data observations on the block-face, and as a unique location-specific identification for those data observations.

⁸Nominal grid denotes the street pattern and similar linear non-street features such as rivers, railways and boundaries.

⁹Geographic grid refers to a Cartesian grid having a known origin and scaled abscissa and ordinate axes that enable positions on the earth's surface to be reckoned in co-ordinate values.

¹⁰United States' plans along these lines have taken the form of Address Coding Guide (ACG) and Dual Independent Map Encoding (DIME) programs for the 1970 Census.

generally small areal units that function adequately in conventional information systems and to which administrators, planners and researchers at large can associate their information needs. In addition, the image of a block-face is readily projected, and actual block-faces can be delimited in the field. Figure 3 illustrates the variability of block-face dimensions and orientation.

In an assessment of the usefulness of the block-face it should be pointed out that it is a significant entity within the street address conversion concept only insofar as its statistical population can be identified and expressed in terms of an address range. A block-face whose content is not expressed by an address range, notably as a result of vacant land or parks and possibly also dwellings, does not become a primary areal unit within the system. This situation can be rectified by establishing a pseudo-address range for the block-face and pseudo-addresses for the block-face components.

The Centroid

The centroid¹¹ is generally the mid-point of the block-face recessed a standard distance from the street centre line; it may also be the recessed mid-point of a segment of a split block-face. The centroid might better be referred to, conceptually at least, as the 'primary area data point' or perhaps 'coded data point'.

The nature of the centroid within the system is highly conditioned by the characteristics of the nominal grid, notably the street pattern and its block-face components.

The number of centroids is equal to the number of primary areal units (that is, block-faces and block-face segments) for which address ranges are present. The usual system, which calculates a centroid for a primary areal unit in association with an address range, could be modified to calculate a centroid for each and every block-face with or without addresses.

The centroid represents the final abstraction of the urban landscape to the context of the geographic grid, for purposes of geocoding. In effect 'area' is mapped as a 'point', leaving a vacuum surrounding discreet points in place of a continuous spatial surface or plane. Each centroid is a point, having no areal extent. The co-ordinate values of the centroid are simply part of the co-ordinate field of the geographic grid. The centroid is linked to the primary areal unit (be it a

Figure 3 – Block-face Dimensions and Orientation

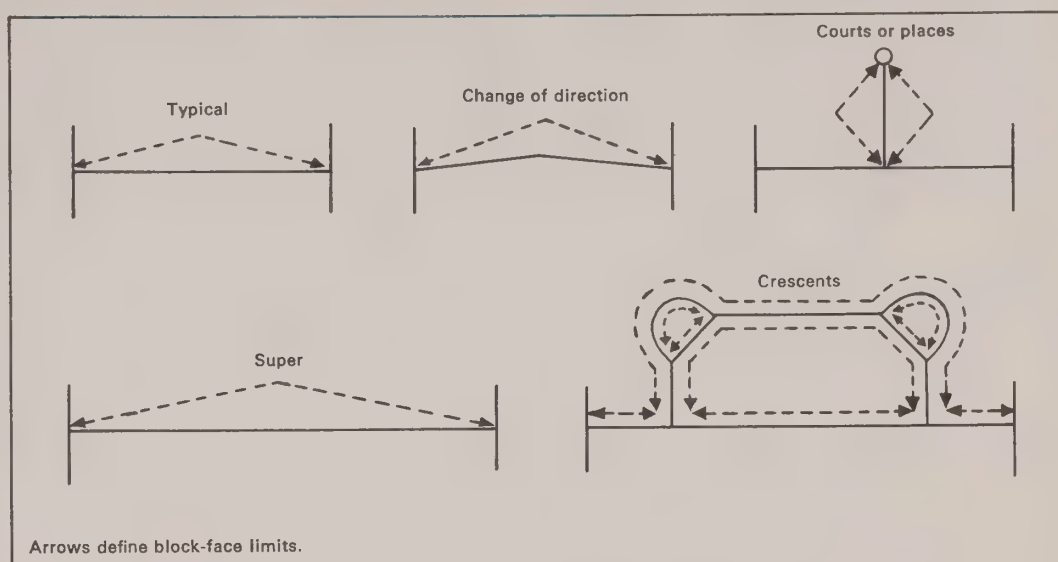


Figure 4 – Variation in Centroid Data Content

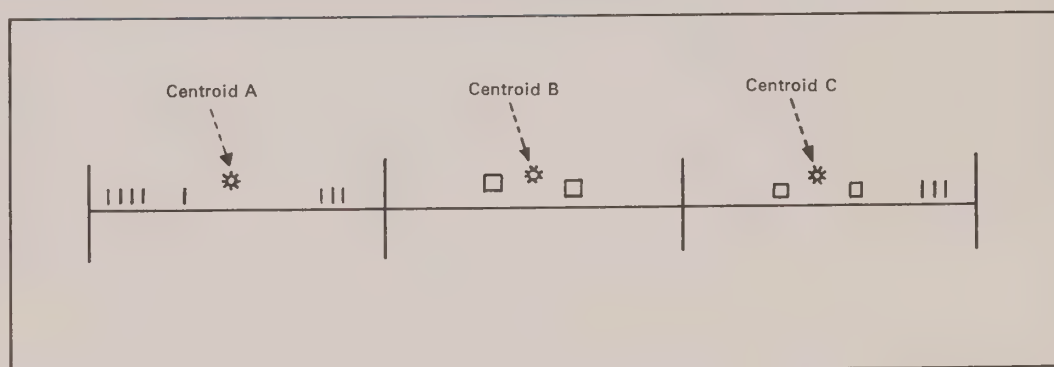
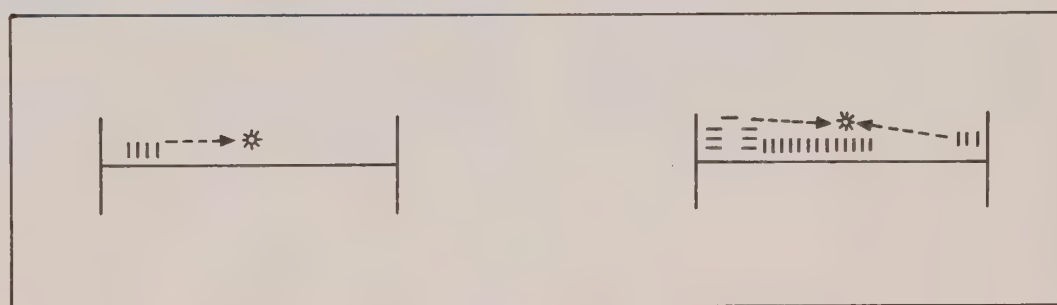


Figure 5 – Data Relocation to the Centroid



block-face or a fraction of a block-face) by an address range expression of that unit.

Centroid data content, that is data attributable to the centroid for data storage, is variable. As Figure 4 illustrates, the data content of a centroid may vary both in quantitative and qualitative terms.

In Figure 4, centroid 'A' is the code and

spatial identification for 8 single-family dwellings; centroid 'B' groups 2 high-rise apartment buildings containing 200 dwellings; and lastly, centroid 'C' groups 2 small apartment buildings and 3 single-family houses for a total of 53 dwellings.

As indicated above, the centroid is the point representation of an area. The reloca-

¹¹See footnote 7.

tion of data from its absolute location to a representative point location follows logically. This is shown diagrammatically in Figure 5.

The spacing of centroids reflects the geometry of the nominal grid, specifically the street pattern. A regular grid street pattern (assuming address ranges throughout) re-

sults in a regular, orderly centroid distribution (see Figure 6).

In irregular street pattern areas the resultant spacing of centroids is less orderly. An example of the distribution of centroids in a curvilinear street area (a type found increasingly in suburban areas and new towns) is shown in Figure 7.

The Address Range¹²

In the context of a street address conversion system, address ranges form the fundamental link between the nominal grid elements – the primary areal units (block-faces and fractions of block-faces) and the geographic grid elements – the centroids.

Effectively the address range defines the statistical population that will be ascribed to the centroid. In this capacity, it exercises a discriminating function, permitting address-bearing data to enter the system. Within its values, the address range contains all of the address numbers of a primary areal unit, but nothing is said about the location or distribution of individual addresses within that areal unit. For this reason and the fact that many block-faces do not contain address ranges, it is more accurate to consider the address range (as opposed to the block-face) as the true ‘building block’ of the system.

While forming a viable link between the primary areal units and the geographic grid, the use of the address range is not without certain disadvantages, most of which can be overcome.

Initially, it is necessary to define an address range for each primary areal unit. Once obtained, such address ranges must be continually checked and updated to ensure that they reflect changes in the street and addressing pattern as the city develops.

A second difficulty arises from anomalies in addressing systems. Though most civic house numbers increase sequentially along a block-face, the system must contend with even numbers occurring within odd address ranges (and vice versa), and occasionally with civic house numbers that cannot be included within a given address range.

A third difficulty presents itself in the case of dwellings (or any other statistical population) that do not bear an address. Such a situation is infrequent in large urban areas, and can be resolved by providing a ‘pseudo’ address for each occurrence.

The disadvantages, mostly operational in nature, of the address range are minor in comparison with the major advantages of its widespread use. More specifically, individual addresses are used extensively by many government agencies and private firms to identify information on statistical populations. Since any data identified by an address can be accorded a centroid value, the data storage design can be ‘open-ended’ to include additional survey data.

¹²See Footnote 6.

Figure 6 – Centroid Spacing and Pattern in a Regular Grid Street Network

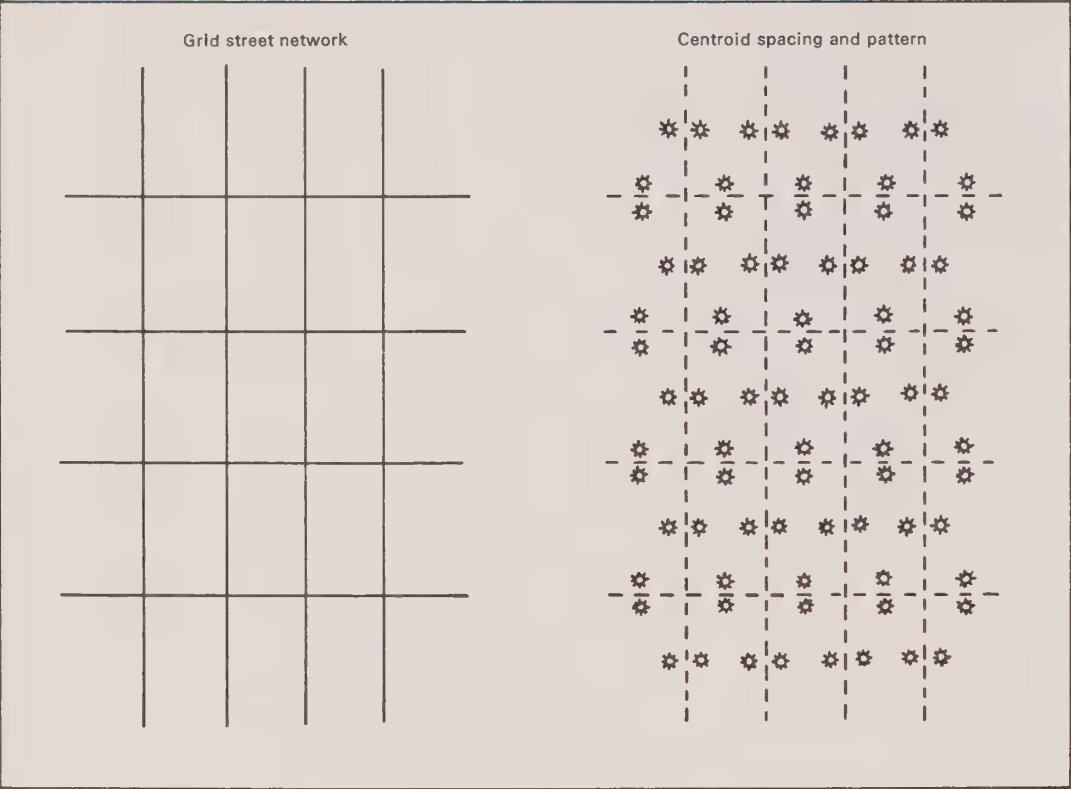


Figure 7 – Centroid Spacing and Pattern in a Curvilinear Street Network

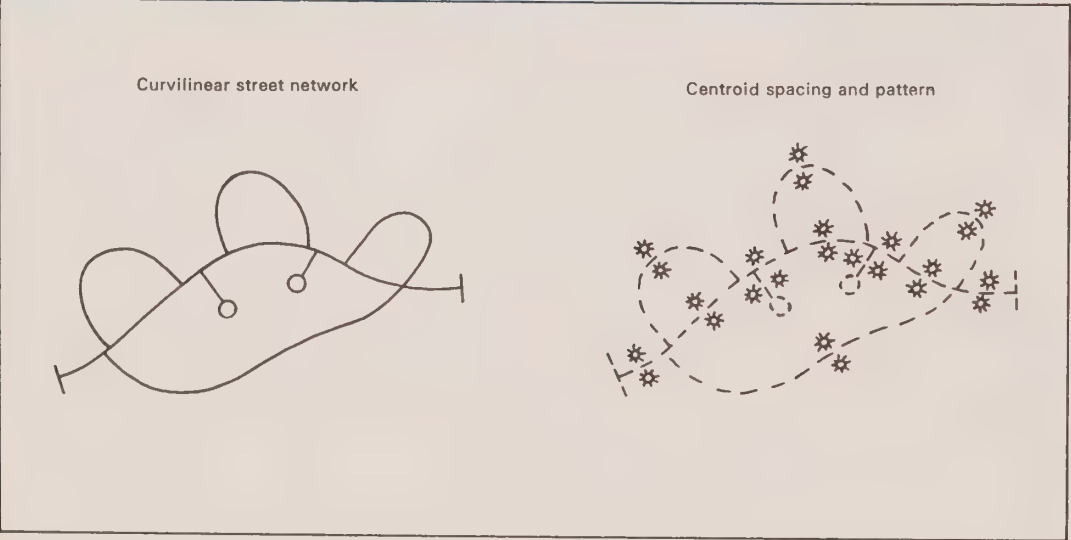
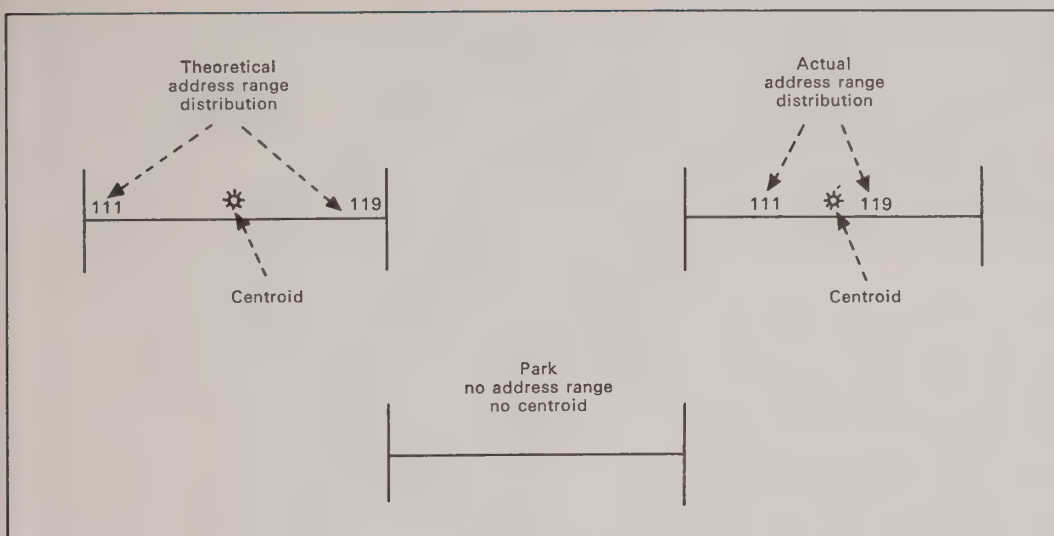
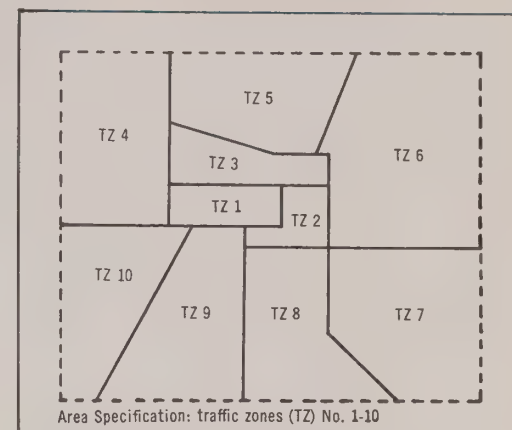
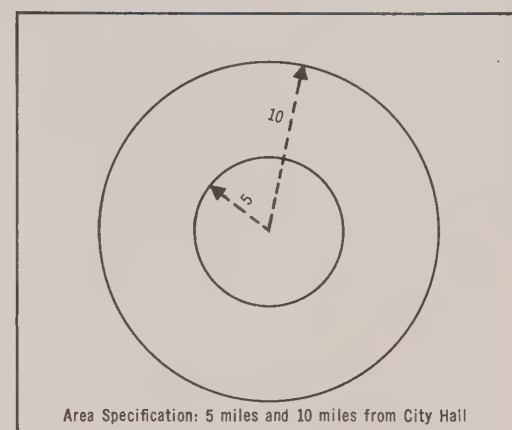


Figure 8 — The Address Range in Terms of the Block-Face**Figure 9 — User-Specified Areas: Polygonal****Figure 10 — User-Specified Areas: Concentric**

Analytical Aspects of Data Storage and Retrieval

A geocoded census data base may be viewed conceptually as one large storage file, although this file may be split into sub-files.

The data observations derived from a census or other questionnaires will be kept separate for each member of the statistical population. The members of the statistical population will be arranged within the geocoded data file in terms of their position within their primary areal unit. Although they are kept discreet for purposes of cross-tabulation of characteristics, all members of the statistical population (and their associated characteristics) are 'grouped' under the centroid of the primary areal units in which they are situated. The orderly arrangement of the primary areal units themselves within the census data file will be according to the co-ordinate values of their respective centroids.

Since a geocoded data file may be conceptually viewed as one large file structured geographically on the basis of the co-ordinate values of centroids, the primary areal units determined under an urban system of geocoding will merge with those primary areal units (of a different nature) designated within a rural geocoding system.

The ordering of primary areal units within the geocoded data file on the basis of their 'centroid' co-ordinate values has a number of advantages at the data retrieval stage.

Any request for data from users must incorporate four elements; statistical population, variable(s), time and space. The geo-

coding system has been designed primarily to contend with the spatial dimension discernible in any user request. In a narrower sense, it has been designed to allow for data retrieval by specified areas of sub-municipality size. The system seeks to provide tabulations for 'ad hoc' areas specified by the user by collecting the data of the individual finely-gauged primary areal units to form the requested aggregation.

Areas specified by users are expected to fall into four main categories: (i) bounded areas or 'polygons'; (ii) concentric zones or distance bands; (iii) street-oriented areas and, (iv) uniform data regions.

Figure 9 presents an example of a polygon request in which the 'area specification' called for data tabulation by traffic zones one to ten.

Other examples of bounded polygon sets might include school districts, planning neighbourhoods, wards and police districts.

Figure 10 illustrates a request for data tabulations by concentric zones, as defined by radii from a central point.

Figure 11 illustrates the specifications of a request for data for both sides of a street between specified intersections.

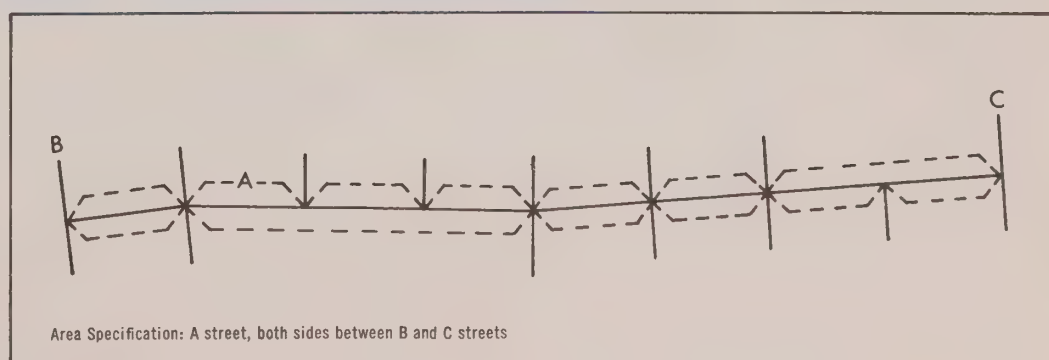
Figure 11 — User-Specified Areas: Street-Oriented

Figure 12 — User-Specified Areas:
Uniform Data

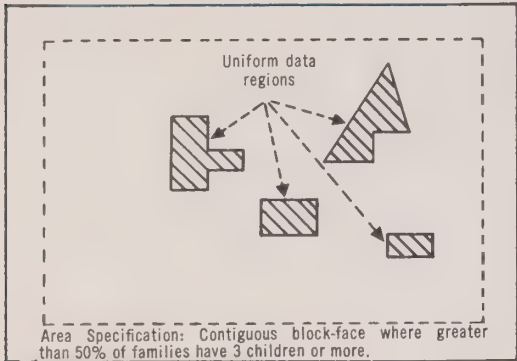


Figure 12 illustrates a form of areal retrieval that may ultimately be practical, i.e., retrieval of tabulated data and regional delimitation based on homogeneous characteristics.

The suitability of the block-face and split block-face as primary areal units in the construction of areas specified by users will vary according to the type of area specification submitted by the user.

The general approach to data retrieval defines the boundaries of user areas in terms of the geographic grid, and subsequently searches the file of centroids using a point-in-polygon geometric algorithm to determine which of the co-ordinate values of the cen-

troids are 'inside' the defined areas. The data coded with the centroids found to lie inside the defined areas are tabulated in accordance with the user's specifications.

One final note on data retrieval should be made. Primary areal units, being small and containing a variable statistical population content may present problems, even in aggregation, in terms of maintaining confidentiality and/or of exhibiting a high sampling and non-sampling error. In the former case, suppression of data would be required in accordance with the regulations of the Statistics Act and, in the latter case, an estimate of such errors might have to be provided with the tabulations.

Summary

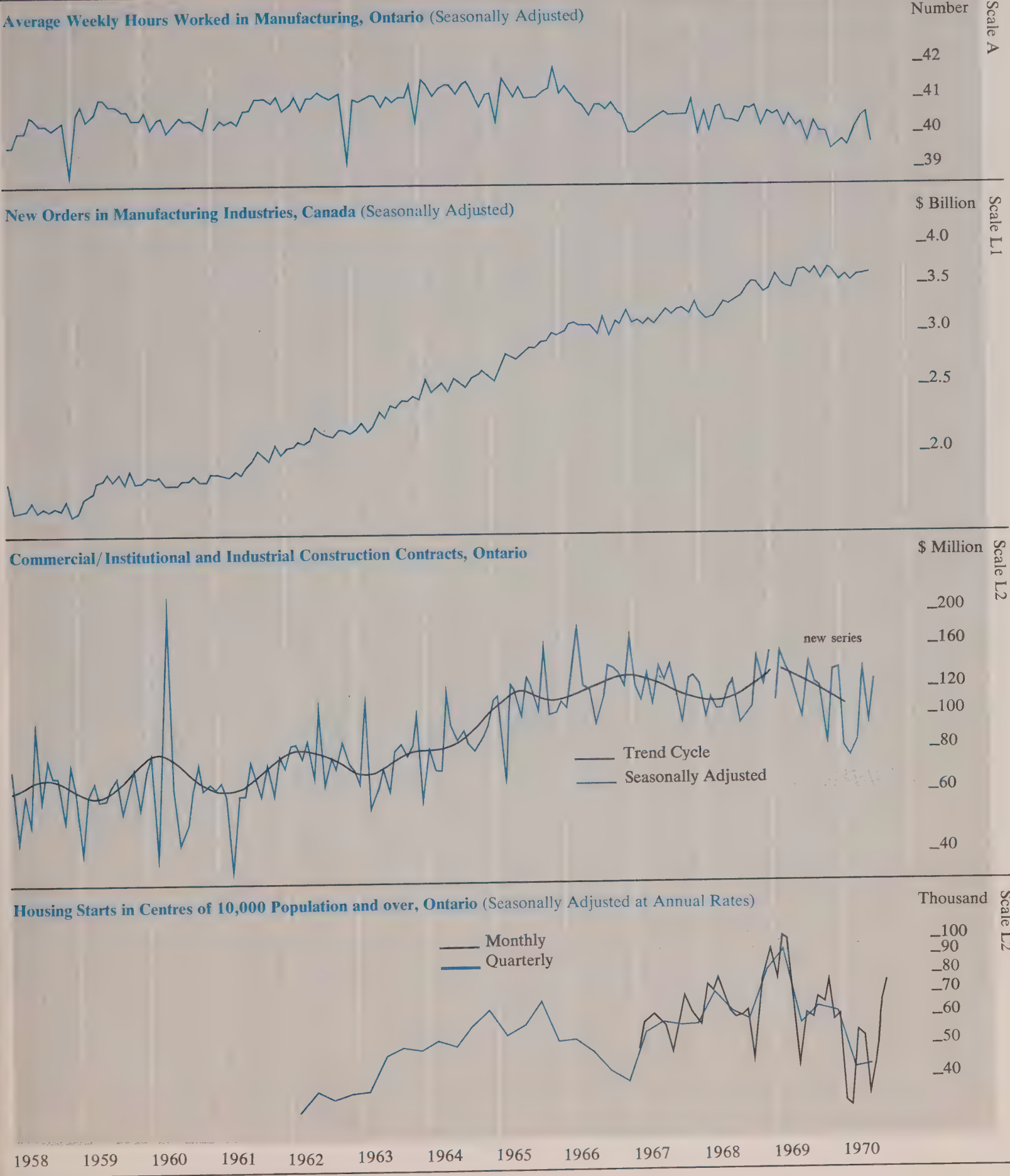
Those elements of the street address conversion node of geocoding for urban areas that might be considered as geographic in nature have been identified as the block-face, the centroid and the address range. The block-face and the address range have been construed as elements of a nominal grid that functions as a spatial framework for referencing data. However, as the nominal grid is an imperfect tool with which to determine either relative or absolute location, it is merged with a geographic grid system by providing each primary areal unit of the nominal grid with a centroid, or co-ordinate location within the geographic grid.

The block-face, block-face centroid, and block-face address range elements have each been examined in detail in order to describe the role that they play in a street address conversion system and to determine the manner in which their characteristics effect the attainment of geocoding system objectives. The study reveals that the address range may be considered the real building block of the spatial framework, although the block-face serves to contain this range physically and to convey a convenient mental image of it. The centroid, however, is the most fundamental element of the operational system. Expressed in geographic co-ordinates, it serves as a code attributable to data observations for the block-face in question and as a unique location-specific identifier for those observations. The Cartesian relationship of centroid co-ordinates permits data for all block-faces to be stored in a single randomly accessible data base, for subsequent aggregation by block-face to satisfy user requests for data by non-standard areas.

In this study the geographic elements of the system have been shown to underpin the entire system concept. Therefore, it seems reasonable to conclude that the development of any spatial information system should include fundamental research into the nature of the spatial framework that ultimately will affect the utility of the system.

Selected Economic Indicators

Leading Indicators



Leading Indicators

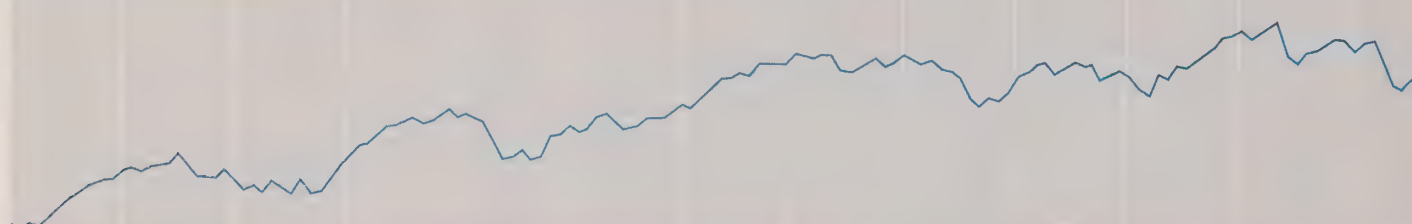
Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
Scale L1
_30
_25
_20
_15
_14
_13



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

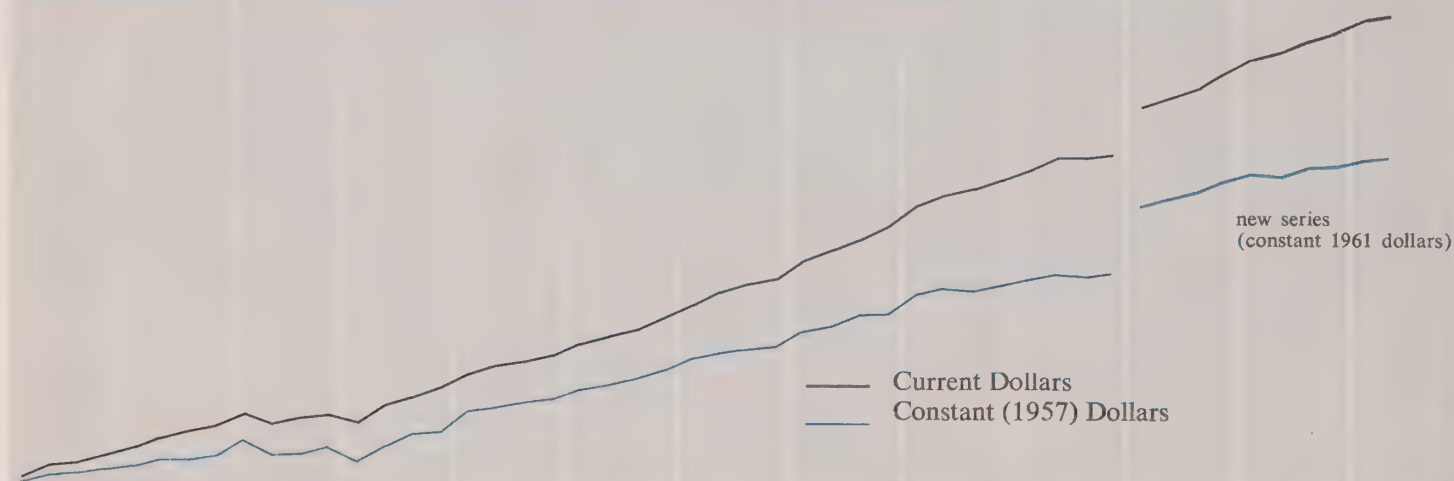
Index
Scale L2
_200
_180
_160
_140
_120
_100



Coincidental and Lagging Indicators

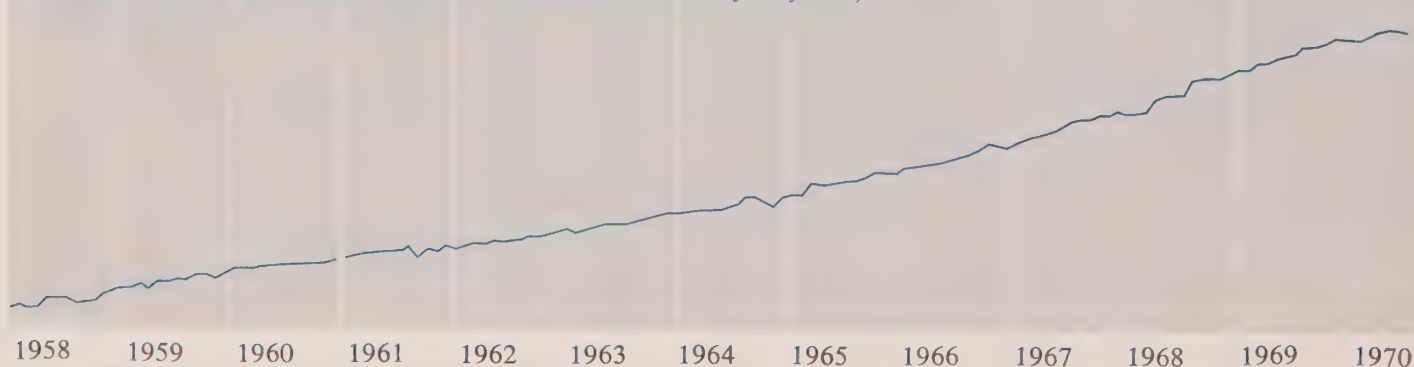
Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion
Scale L1
_80
_70
_60
_50
_40
_35



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Dollars
Scale L1
_3.00
_2.50
_2.00



Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent

Scale A

8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0

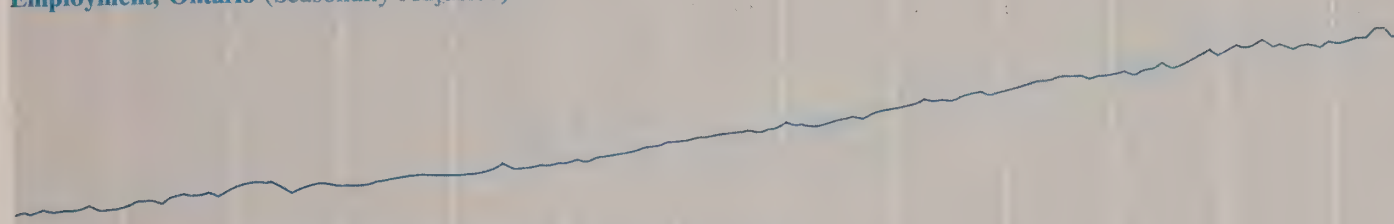


Employment, Ontario (Seasonally Adjusted)

Million

Scale L1

3.00
2.50
2.25



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)

% of
Labour
Force

Scale A

2.0
3.0
4.0
5.0
6.0

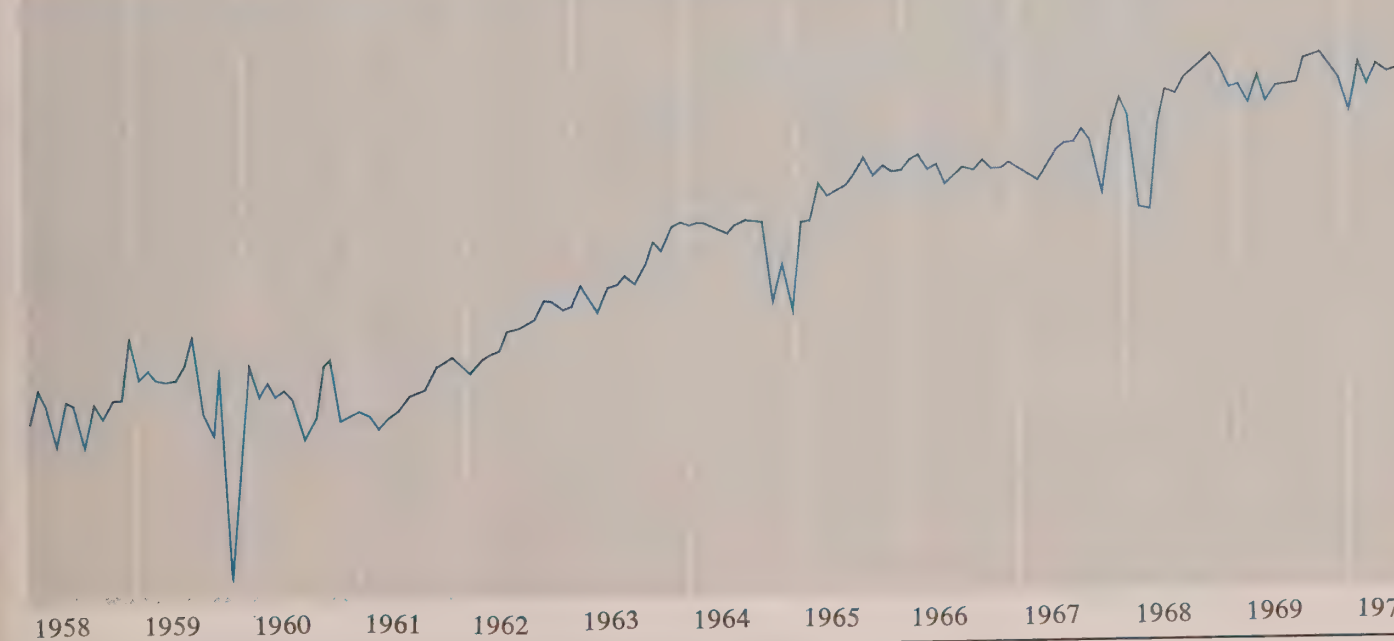


Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)

Index
1961 =
100

Scale L2

400
300
200
100
70
50



1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970





Ontario Economic Review

Nov/Dec 1970
Volume 8, Number 6

Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario
and Minister of Economics

H. Ian Macdonald, Deputy Minister

Ontario Economic Review

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The Ontario Economy

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A publication of the
Department of Treasury
and Economics
Government of Ontario

Hon. Charles S. MacNaughton
*Treasurer of Ontario and
Minister of Economics*
H. Ian Macdonald
Deputy Minister

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

About The Review

The November/December edition of the *Ontario Economic Review* presents an article on the methodology underlying the development of a comprehensive set of economic accounts for Ontario comparable to the National Accounts. Provincial economic accounts constitute an invaluable tool for quantitative economic analysis and provide the indispensable data base for the development of an econometric model for the province.

The first section of the article outlines the conceptual framework of the Ontario accounts, while the second part of the study provides a concise exposition of the estimation procedures employed. The final section presents a description of the sectoral accounts and their structural interrelationships. Annual estimates of the major components of Ontario Provincial Product for the period 1957-1969 are presented in the Appendix.

This article was prepared by Dr. M. V. Chari and Mr. R. H. Frank, Director of the Economic Analysis Branch. Dr. Chari is Professor of Economics at McMaster University and has been associated for the past two years with the Economic Analysis Branch of the Economic and Statistical Services Division as a research consultant. The authors acknowledge with appreciation the contribution of Mrs. P. Fromstein, Senior Economist with the Provincial and Regional Accounts Section.

Indicator Charts, Pages 18-20

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 18-20 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.

THE ECONOMY IN TRANSITION

This has been a year of economic adjustment for Ontario and Canada during which policies to counter inflationary pressures have produced some positive results, but the effects have been cushioned by the extraordinary strength of export sales. The strategy of both the federal and provincial authorities has been to move away from the over-strained conditions of 1968-69, through a rather extended transitional period, and on finally to a more desirable state of non-inflationary long-term growth. Implicit in this strategy was a slowing down of production and employment and the opening-up of a margin of unused capacity in the economy.

At the national level, this change of pace began to show through in the second half of 1969, although the trend during this period was far from clear due to serious strike interruptions. In the first quarter of 1970 a recovery of this lost output, together with the attainment of a record surplus on external trade, kept production from going into a decline. However, it was apparent at the outset of the year that the rates of growth of production and employment were slowing; construction work had already begun to slide off, and a distinct softening in consumer spending and business capital investment was beginning to appear.

By mid-year the purchase of consumer durables had fallen off by over 5.0 per cent compared to the similar period last year. Declining rates of growth in personal income after taxes, tighter credit, lower rates of housing completions, a disappointing stock market performance and general consumer uncertainty contributed to the fall in consumer expenditures on durables. During the first half of 1970 sales of furniture, appliances and radio and television sets through retail outlets were 3.8 per cent below comparable 1969 levels.

Business outlays for plant and equipment declined slightly in the first half of 1970, affected by prolonged strikes in the construction industry, as well as tight money conditions and the contraction in cash flows as the result of lower corporate profits. This decline largely reflected lower spending on machinery and equipment. Earlier this year official estimates indicated that total machinery and equipment demands in 1970 would rise by approximately 8.0 per cent. However, the mid-year survey released by DBS in August, indicated that corporations, institutions and governments in Canada planned to increase

machinery and equipment purchases this year by 11.0 per cent. The statistical evidence for the first half of 1970 suggests that the Canadian market has failed to grow at the pace outlined by the survey. In fact, this year may witness the largest ever discrepancy between actual and intended business investment.

If corporate reports of intentions to purchase machinery are credible, then demands in the second half must rise substantially. However, it is highly unlikely that the increase will be strong enough to bring about an 11.0 per cent rate of growth. An increase this year of approximately 5 to 6 per cent in total demand seems more probable and even an increase of this magnitude implies substantial demand strength in the last half.

Much of this year's intended investment was for labour-saving equipment which, though postponed this year, will probably be installed next year when easier credit conditions and the subsidence of some inflationary pressures as well as construction strikes clear the way for a resumption of higher levels of capital spending. Moreover, as hourly wage and salary costs continue to rise at unsustainable rates, it is apparent that corporate expenditures on machinery and equipment will become even more attractive. During July, August and September wage settlements indicated an average annual increase in base rates of 9.5 per cent according to recent information issued by the federal Department of Labour. The settlements analysed cover bargaining units of 500 employees or more with the exclusion of the construction industry.

One area where investment and employment conditions may improve is the agricultural machinery industry in Ontario.

After several years of disappointing export sales, lower prices and mounting stocks, the prospects for Canadian wheat now look sharply brighter. The new sales agreement with China, the recently announced sales to Algeria and the generally improved outlook for expanding exports of Canadian wheat and barley may cause a new optimism on the prairies which could lead to improved sales in farm machinery.

The agricultural implements industry in Ontario has been depressed recently with employment levels running approximately 25.0 per cent below those of 1969. This industry which employed about 6,500 persons in Ontario in June 1970 is not one of the larger in the province, but has been of particular con-

cern because its activity in the past few years has been considerably less buoyant than most of our other manufacturing industries. Moreover, since a major concentration of activity in this industry exists at Brantford, the economy of the city is closely tied to the performance of this sector.

Recent performance has continued to be poor. Sales of farm implements and equipment in Canada for the period January to August 1970 amounted to \$206.4 million, a decrease of 18.2 per cent from the \$252.5 million attained in the corresponding period in 1969. Much of this decrease is due to the cutbacks in acreage of western wheat under the federal Operation L.I.F.T. Program (Low Inventories For Tomorrow) and the resultant poor economic position of western farmers.

However, the new export agreements in addition to the reduced 1970 wheat crop have prompted the Hon. Otto Lang, the federal minister responsible for the Wheat Board, to announce that Operation L.I.F.T. may not be necessary next year. These factors may also lead to some improvement in farm equipment sales, and hence employment in the farm machinery manufacturing industry.

Implicit in the Government's strategy to combat inflation was a gradual shift towards easier official policies as soon as a distinct slowing in the economy emerged. By the second quarter of this year definite signs of a moderating pace were evident. Although wage settlements continued to be high, wholesale price inflation was slowing, perhaps because of the program of voluntary price restraint. The unemployment rate which had been climbing steadily since the beginning of the year reached a seasonally adjusted level of 6.2 per cent for Canada and 4.6 per cent for Ontario in May. In addition, the Consumer Price Index which had been rising at an annual rate of 4.2 per cent since January dropped to an annual rate of 3.2 per cent in June.

Recognizing the turning of the tide and the inevitable lags between policy action and market response, the Canadian authorities began gradually to shift away from their previous policies of restraint to measures aimed at forestalling any extended slowdown and at encouraging a moderate re-expansion. In mid-May, the first overt hint of a policy shift was signalled by a lowering of the bank rate from 8.0 to 7.5 per cent. Upon the floating of the exchange rate at the end of May, the bank rate was again reduced from 7.5 to

7.0 per cent and at the first of September there was a third cut to 6.5 per cent. This was followed early in November by an additional reduction in the official lending rate to 6.0 per cent. During the period from April to June the rate of increase in money supply (currency outside banks plus total bank deposits) rose to nearly 12.0 per cent (seasonally adjusted annual rate) and since then has been increasing at approximately 6 to 7 per cent.

The shifting monetary policy plus federal outlays for the wheat adjustment program, for housebuilding and grants to provinces as well as added unemployment assistance combined to prevent a serious downturn.

Primarily due to the strength of Canada's export sales, but also because of increased government expenditures, real output at mid-year was roughly 2.0 per cent higher than a year earlier. This, in turn, tended to limit the slowing of Canadian incomes and profits. In spite of these stabilizing influences incomes did slacken through the first half of the year and consumer spending was characterized by caution and restraint. As pointed out previously, housebuilding showed a fairly similar decline and the pace of business capital expenditures fell well short of announced intentions. Through the summer the overall production trend flattened as export performance tapered off and in mid-September the balance was tilted downward by the automotive strike at General Motors.

The biggest single factor affecting the Ontario labour market in the second half has been the dispute between General Motors and the United Auto Workers. At time of writing over 25,000 men and women in Ontario were not working because of the strike and of these, nearly 5,000 were not employees of General Motors. A total of almost fifty different companies are directly or indirectly involved in the stoppage. One interesting aspect of the strike reported by Canada Manpower Centres was the significant increases in married women (the wives of workers on strike or locked out) entering the labour force to seek jobs which would supplement the strike pay or unemployment insurance their husbands received.

It is also of significant interest to note that a study of the record of work stoppages throughout the postwar period reveals that no single strike or combination of strikes — with the sole exception of the extraordinary 116-day steel strike in the United States in

1959 — seems to have had more than transitory effects on the shape of the general business curve. While general activity may be significantly affected for a short time, strike-period losses usually are pretty much balanced out by make-up production and sales in the period following settlement. There is no reason to suppose that this won't be the pattern again in the case of this year's automobile shutdown.

What a major strike can do, of course, is to blur trends markedly, both during the time it lasts and immediately after it is over. Since the United Auto Workers' strike in Canada has now lasted over two months, it may well be early in 1971 before it will be possible to judge whether recovery in the economy at large has begun.

Preliminary estimates of Gross National Product in the third quarter recently released by DBS indicate modest improvement in activity but confirm that in recent months the Canadian economy has been going through a sluggish period of adjustment. During the third quarter GNP rose by 1.3 per cent or one billion dollars to an annual level of \$84.1 billion. This was a better gain than the increase of one-half of one per cent in the second quarter, but well below the average quarterly rate of increase of approximately 2.2 per cent experienced in the last few years. After accounting for rising prices, the gain in volume of production amounted to 0.4 per cent. This compares with a marginal constant dollar decline of 0.1 per cent in the second quarter and with an 0.8 per cent increase in the first quarter.

The acceleration in economic expansion in the third quarter appeared more due to a modest recovery in total fixed capital formation than to notable strength in any major component of demand. But in spite of a moderate gain of \$264 million, spending in this sector for the first nine months of the year was still running at a level considerably lower than the anticipations for 1970 as reported in the mid-year survey of intentions.

Consumer expenditure on goods and services, the other sector that showed persistent weakness in the first half of the year, rose somewhat faster in the third quarter and made the major contribution to total demand. However, the largest percentage gain occurred in government expenditure on goods and services, which, with a 2.0 per cent increase, continued to be an important source

of support to the economy. Offsetting these increases to some extent, exports of goods and services fell by \$312 million from the very high level of over \$21.1 billion achieved during the first quarter and maintained through the second quarter. The decline of 1.5 per cent was entirely caused by lower merchandise exports to the United States and the United Kingdom; service exports rose by 2.2 per cent, largely due to higher interest and dividends receipts.

Merchandise imports also declined in the third quarter, by 1.8 per cent, in spite of an increase in imports of machinery and equipment. According to DBS increased service imports, paced by travel payments, offset the decline in merchandise, leaving total imports only marginally higher than in the second quarter. The net result of external transactions was to lower the surplus with non-residents, on a national accounts basis, from \$1,056 million to \$720 million.

Distribution of Manufacturers' Shipments, 1967

Canadian producers shipped 56 per cent (by dollar value) of their products to destinations within their own province, 28 per cent to destinations in other provinces, and 16 per cent to foreign countries in 1967. This relationship has been established for the first time in a survey conducted by the Dominion Bureau of Statistics.

The study of shipments from manufacturer to manufacturer and manufacturer-to-whole saler adds a new dimension to comparison of provincial economies. For example, Ontario's shipments (valued at \$20,025 million and representing 52 per cent of the national total) followed the national pattern very closely — 58 per cent to destinations within the province, 28 per cent to other provinces and 14 per cent to foreign countries. Quebec shipments (\$10,790 million — 28 per cent of the national total) were also close — 54 per cent within the province, 30 per cent to other provinces, and 16 per cent to foreign countries. But Newfoundland, with shipments valued at \$184 million (0.5 per cent of the national total) kept 38 per cent of its shipments within its borders, sent 2.0 per cent to other provinces and exported 60 per cent while Saskatchewan (\$470 million and 1.2 per cent of the national total) kept 74 per cent within the province, sent 22 per cent to other provinces and exported only 4.0 per cent.

Tax Reform and Small Business

A new incentive for small business, which would provide personal tax relief for Canadian owner-operators, was proposed by Ontario Treasurer Charles MacNaughton at the recent federal-provincial meeting of finance ministers in Ottawa.

The Ontario plan, which would replace the present dual rate of corporation income tax, would give a tax credit of up to \$10,000 annually to any Canadian who invests capital, to start or expand his own business, whether alone or with other Canadians. An entrepreneur would receive a personal tax reduction equal to 50 per cent of his increased investment in any one year. The proposed tax reduction would be limited to one-half of his personal tax liability or to \$10,000 annually. Lifetime limit would be \$100,000.

Mr. MacNaughton said the plan offers greater encouragement to Canadian entrepreneurs and more flexibility for business developments than either the present lower corporation tax rate or proposals advanced by the Commons and Senate committees on tax reform.

The Treasurer suggested the effect of his proposal would be to provide interest-free loans for small-business investment. The tax loans would be recovered on death, emigration or withdrawal of investment, but rollover provisions would permit re-investment and avoid lock-in problems. By being based on investment, the tax incentive would be available to both old and new businesses. The benefit would not be delayed until the investment returned a profit, thereby providing assistance during the most difficult period of a business development.

Unlike the lower corporation rate, the incentive would not be restricted to incorporated businesses. Entrepreneurs could qualify as a proprietorship or in a partnership, as well as in an incorporated firm. The tax credit would not be available to non-residents, passive investors or corporations.

The small business proposal was tabled in two separate documents — one discussing the best means of promoting entrepreneurship in Canada, the other concentrating on administrative aspects of the specific Ontario proposal. This totals five comprehensive documents which Ontario has contributed to the debate on national tax reform. The series began with a study of the revenue effects of the proposed federal reforms and a compre-

hensive set of Ontario proposals both published in June 1970, followed by an analysis of the Ontario proposals which was recently released.

The small business incentive proposal reflects Ontario's conviction that national tax reform must encourage economic development and should help Canadians develop their own business operations. While not discriminating against foreign investment in Canada, the incentive focuses on development of the Canadian economy by Canadians.

Mr. MacNaughton listed many advantages of his proposal. However, he acknowledged it is a new tax plan which has not been tested in any other country. Accordingly, he urged that the proposal receive extensive review from both federal officials and organizations such as the Canadian Bar Association, chartered accountants and the Canadian Tax Foundation. If necessary, he stressed, the dual corporation income tax rate should be retained, even if other tax reform measures proceed, until a new incentive plan can be implemented.

Principles of the Ontario small business proposal could also be incorporated into a tax credit plan to encourage capital investment in Canadian-controlled business in areas of special public interest. The incentive could be aimed at Canadian investors in businesses where foreign ownership is restricted to 25 per cent, or any other appropriate qualification.

Comparing this approach to the proposed Canada Development Corporation, the Treasurer said it "would decentralize investment decisions in areas identified for special incentive, as opposed to even more centralization in another government bureaucracy".

The Ontario plan for small business has advantages over both the Commons and Senate committees' proposals, according to the paper. It suggests that the Commons proposal of a disappearing incentive would impose a tax of 66.3 per cent on the first \$70,000 of business income above \$35,000. Similarly, the Senate proposal would entail a tax rate of 100 per cent on the first \$21,150 of business income above \$100,000. It is felt that these high rates would penalize success and encourage tax manipulation to keep income down. Ontario also feels that a size of newness test such as proposed by both the Commons and Senate committees would be

difficult to administer and would penalize growth.

Acknowledging that the federal government is also preparing a small business incentive proposal, Mr. MacNaughton urged that it be referred to the provinces for review and discussion along with the Ontario plan.

Highlights of Proposal

- A personal income tax credit (reduction) of 50 per cent of increased business investment, to individual owner-operators, would replace the present dual corporation income tax rate over a staging period;
- The tax credit would be restricted to individuals who combine their own capital and efforts to run their own business, alone or with others;
- The tax credit would be available only to Canadian residents — not to non-residents, passive investors or corporations;
- The maximum annual credit would be limited to \$10,000 with a lifetime limit of \$100,000.
- Increased business investment which resulted in a higher tax credit than could be deducted in the year of investment could be carried back one year and forward indefinitely;
- Investment in proprietorship, partnership or incorporated business would qualify;
- Property investments, portfolio securities and mining, gas and oil investments would not qualify;
- Value of the incentive would be recovered fully or partially on death or permanent emigration and on disposition or withdrawal of investment;
- Reasonable rollover provisions would permit reinvestment and avoid lock-in effects;
- The proposed maximum annual tax reduction available to an individual provides approximately the same maximum benefit now available from the lower corporate rate;
- Use of a tax credit approach would give substantially the same proportionate benefit to both low- and high-income earners.

Effects of Ontario's

Personal Income Tax Proposals

On November 30, 1970 the Taxation and Fiscal Policy Branch of the Department of Treasury and Economics published a staff paper demonstrating the financial feasibility of Ontario's proposals for personal income tax reform in Canada.

The "Effects of Ontario's Personal Income Tax Proposals" is a detailed analysis of

Ontario's proposals for personal income tax reform presented in Winnipeg during the June meeting of the ministers of finance. The analysis is based on the Ontario General Income Tax Analyser (GITAN) and is on exactly the same basis as the "Analysis of the Federal Tax Reform Proposals, also presented at the Winnipeg conference.

Included in the staff paper for the first time is an income tax rate schedule designed to complement Ontario's other proposals.

The results of the analysis of Ontario's proposals indicate that over the entire tax system the Ontario reforms would produce no over-all revenue changes in the test year 1969. Revenue from the personal income tax would fall by some \$300 million, a loss which would be recovered from changes to the corporation tax and the taxation of capital gains.

Ontario's proposals for personal income tax reform are based on a selective approach to providing tax relief for low income persons, and include a provision designed to integrate sales, property and income taxes for very low-income Canadians. On the basis of 1969, the Ontario personal income tax proposals would provide \$188 million in cash transfers to Canadians not currently earning enough to pay income tax, in order to offset the property and sales tax these persons pay. The proposals would provide

a further \$75 million in added exemptions for single Canadians earning less than \$3,000 and families of four earning less than \$5,100. Other proposals include \$290 million in tax reductions for employment expense allowances and \$50 million in tax credits for child care costs incurred by working mothers and single parents. Approximately \$185 million in revenue increases would arise due to the taxation of a variety of currently untaxed items such as employer medicare contributions and a revised treatment of fringe benefits, among others.

The rate schedule proposed by Ontario contains a variety of interesting new features, the most notable of which is a split rate. The proposed rate schedule contains one set of rates for single individuals and a second preferential set to be applied to couples and families, the two rates merging to form one rate at a taxable income of \$3,000. The effect of the rate differential is to provide a constant \$110 difference in taxes between single persons and families at equal taxable incomes. Other features include low initial rates (12 per cent for families in contrast to a federal white paper rate of 21.76 per cent and a present rate of 14.80 per cent), a modest progression in rates over the middle income range and a top rate of 65 per cent on taxable income over \$100,000. The effects of the

proposed rate schedule, when combined with Ontario's other proposals are to provide tax reductions for single persons earning less than \$5,600, couples earning less than \$9,300 and families of four earning less than \$10,000 per year.

The GITAN analysis of Ontario's proposals clearly shows that they do indeed constitute a viable reform alternative, producing no overall revenue change, while at the same time providing more significant tax reductions for low-income persons than any set of proposals put forth to date. By using a selective approach to tax reduction and tax credits instead of exemptions whenever possible, it would be possible to provide almost \$400 million in low-income tax relief without massive increases in taxes on middle and lower middle income taxpayers.

Copies of the five publications: Ontario Proposals for Tax Reform in Canada; Tax Reform and Small Business; Analysis of the Federal Tax Reform Proposals; Effects of Ontario's Personal Income Tax Proposals; and Technical Study on Tax Reform and Small Business are available upon request from the Taxation and Fiscal Policy Branch Policy Planning Division, Department of Treasury and Economics, Frost Building, Queen's Park.

The Development of Ontario Economic Accounts

M. V. Chari and R. H. Frank

Department of Treasury and Economics

In 1969 the Economic Analysis Branch of the Department of Treasury and Economics initiated a continuing research program to explore in depth the methodology of regional product estimation and, in particular, to develop national account type data on the provincial and sub-provincial levels. Reflecting the existing data and time limitations, this research was concentrated mainly on those components available at the national level which are susceptible to provincial decomposition. Provincial economic accounts constitute an invaluable tool for quantitative economic analysis and provide the indispensable data base for the development of an econometric model for the province.

During the second half of 1969 a comprehensive set of economic accounts with a conceptual framework similar to the national accounts was designed for the Province of Ontario. Estimates of the various components of the provincial accounts were essentially derived from the published national accounts and related information available from Dominion Bureau of Statistics publications.

Reflecting the availability of new data and significant improvements in the statistical information system, DBS recently completed a comprehensive revision of the Canadian national accounts. However, since these revisions were not available at the time when the Ontario research project was initiated, the provincial income and expenditure components were first estimated on the basis of the available unrevised national accounts data. Nevertheless, this initial effort proved to be extremely useful in developing the basic conceptual framework and methodology required to derive provincial income and expenditure estimates. As the revised national accounts became available¹, comparable adjustments to the provincial accounts were implemented. In addition, revision of the data provided an opportunity to re-examine the basic concepts and methods used in developing the provincial accounts to ensure their compatibility with the new DBS format.

It should be emphasized that at provincial level there is a choice of two basically different alternatives within the framework of the traditional social accounting system, i.e. the "national" and the "domestic" concept. In general the "national" and the "domestic" concepts essentially distinguish incomes received by residents of the region from outputs produced within that region. However, at the provincial level the basic

conceptual difference between "income" and "output" must be independently recognized. For the purpose of this study, the income rather than the product approach was adopted and the income and expenditure estimates for the province of Ontario shown in the statistical appendix are based on the "national" concept.

However, it is recognized that both the national and domestic concepts have advantages and disadvantages depending on the intended analytical use of the resulting estimates. Generally speaking, the accounts based on the "national" concept provide a deeper insight into the impact and dependence of the Ontario economy on the rest of Canada whereas the purely "domestic" framework measures more effectively economic activity strictly within the geographic confines of the province.

For this reason, the Economic Analysis Branch has initiated, during the second half of 1970, the development of a set of income and expenditure estimates based on the "domestic" concept to facilitate a more comprehensive analysis of the interaction of the Ontario economy with other provinces and the rest of the world. Work on this project is expected to be completed early next year and a detailed description and comparative analysis is scheduled for publication in the *Ontario Economic Review*.

The present study describes in detail the underlying methodology for the development of a comprehensive set of provincial economic accounts on the basis of the "national" concept. The first section outlines the conceptual framework of the Ontario accounts, while the second part of the article provides a concise exposition of the estimation procedures employed. The final section presents a description of the sectoral accounts and their structural interrelationships. Annual estimates of the major components of Ontario Provincial Product for the period 1957-1969 are presented in the Appendix. A complete historical tabulation and analysis of the sector accounts will be published in a special supplement of the *Ontario Economic Review*.

THE CONCEPTUAL FRAMEWORK

The estimation of provincial product by decomposition of national series rather than by collection of independent provincial data implies that the structure and conceptual framework of the Ontario provincial accounts are determined to a significant degree by the national accounting system. Never-

theless, some modifications, such as the explicit inclusion of interprovincial flows, were necessary in developing regional components which have no direct counterpart in the basic national accounting system.

National accounting essentially provides a systematic description of the operation of the economy by bringing together the various transactions between the different economic units and organizing them into a set of inter-related sector accounts. The sector accounts are typically designed to distinguish between relatively homogeneous classes of transactors and the types of transactions. The exact number of sectors and types of transactions distinguished in a national accounting system obviously depend upon the desired level of detail, the availability of data and ease of statistical estimation, the underlying institutional framework and the extent of their usefulness in economic analysis.

In the Canadian System of National Accounts, four sectors or transactor groups are distinguished: persons, governments, business, and non-residents. Similarly, four types of transactions are identified: (i) transactions in which the services of factors of production are exchanged for money or claims on money; (ii) transactions in which goods and services produced domestically or imported (other than the factors of production) are purchased with money or claims on money; (iii) transactions in which financial claims (and not real product) are exchanged for money or claims on money; (iv) transactions in which goods, services, money, or financial claims are remitted with none of these items being received in exchange and are, therefore, collectively designated as transfer payments.

This broad classification of sectors and transactions is retained in the recent DBS revisions. However, significant changes have been made in the definitions of the sectors, and in the conceptual treatment of certain transactions which entailed a major reclassification of items in the revised format of the sector accounts. For example, public hospitals have been transferred from the personal to the government sector, municipal waterworks from government business enterprises to general government, social insurance contributions are now treated as part of personal income, and withholding taxes are regarded as incomes accrued to non-residents.

Essentially, the transactions for each sector can be organized into four basic accounts:

¹The summary tables of the revised national accounts have since been released: Dominion Bureau of Statistics, National Income and Expenditure Accounts, 1926-1968, August 1969; a special supplement to the detailed

report National Income and Expenditure Accounts to be published later. The corresponding analysis of the sector accounts was provided through the courtesy of the Dominion Bureau of Statistics.

production, income and expenditure, saving and investment, and financial flows. These four accounts for each of the four sectors can be conveniently regrouped to form a compact set of sector accounts. The Canadian national accounts prior to the recent revision consisted of a set of six sector accounts: an income and expenditure account for persons, governments and non-residents respectively, a production account for the business sector (business operating account), a consolidated investment income appropriation account and a national saving account.

In the revised format income and expenditure accounts are identified for the following sectors: persons, including private non-profit institutions and unincorporated business; government; corporate and government business enterprises; and non-residents. The former business operating account has been expanded into a consolidated production account. The saving and investment account is now shown separately for each of the four sectors instead of a single consolidated statement, thus distinguishing between the current income and expenditure accounts and the capital finance account for each of the four sectors. The previous investment income appropriation account which represented a consolidation of all sectors has been abolished but most appropriations of investment income appear now in the current income and expenditure account for corporate and government business enterprises.

The national accounts constitute the essential data base for the design of provincial accounts. The theoretical basis and the conceptual framework of the national accounts have been taken into account in attempting their regional decomposition. Attention was directed to reconciling the two formats of the sector accounts in order to take maximum advantage of the information available and to arrive at an internally consistent structure for the provincial accounts.

The Sectors

The sectoral classification of the Ontario provincial accounts was determined on the basis of the structure and availability of the national time series and the intended use of the provincial estimates. Six sectors were incorporated in the provincial accounts: a personal sector; the various levels of government in Ontario; the business sector; the federal government; the rest of Canada; and the rest of the world. An alternative classification comprising only four sectors, as used

in the national accounts, would imply consolidation of the federal government, the rest of Canada, and the rest of the world into a single non-resident sector.

Although these sectors have the common characteristic of being non-resident relative to Ontario, they differ significantly in terms of their relationships with the various Ontario sectors. In view of their policy implications for the Ontario economy it is important to explicitly distinguish federal-provincial transactions. As it is statistically difficult and of less significance from a policy point of view to isolate the various sub-sectors of the rest of Canada sector, they were consolidated into a composite sector. However, attempts have been made, whenever statistically feasible, to tentatively differentiate economic units within the rest of Canada sector.

The definitions of the various sectors conform closely to the corresponding national concepts. Thus, the personal sector is composed of all persons (including private non-profit organizations) resident in the province of Ontario. The residence status, at the operational level, is determined strictly by the classification scheme adopted by DBS for the provincial distribution of personal income. The Ontario government sector comprises all general government departments and agencies at the provincial and local levels. Government business enterprises are treated as part of the Ontario business sector, while public hospitals, starting with 1961, are included in the government sector rather than in the personal sector in accordance with the recent DBS revisions.

Although the national accounts definition of the business sector was accepted in broad terms, some definitional modifications were introduced to facilitate the conceptual and statistical treatment of corporations operating in Ontario as well as in other provinces. The alternatives are to treat such corporations either as single entities ascribing their total income to one particular province or to allocate corporate income to those provinces in which a company operates. Essentially, this implies the derivation of corporate income either on a "national" basis with a subsequent adjustment to a "domestic" concept or defining the corporate sector as inclusive of all operating establishments in a particular province regardless of its legal entity yielding a "domestic" income estimate which could then be adjusted to the "national" concept.

While both approaches have advantages and disadvantages, the former was adopted as a basis for the development of the Ontario provincial accounts since its application preserves the legal entity of corporations and results in a meaningful provincial distribution with respect to intersectoral transactions. Therefore, all corporations filing tax returns with Taxation District Offices located within the province of Ontario in accordance with the information provided by the Department of National Revenue, are considered as belonging to the Ontario corporate sector.

The federal government sector is treated essentially as non-resident in a national accounting sense. Only transactions between the federal government and persons, businesses and governments of Ontario are considered, while all federal operations conducted with those outside the province are ignored. This conceptual treatment emphasizes the "national" rather than the "domestic" basis of income estimation.

The conceptual basis for the estimation of the remaining two non-resident sectors is similar to that of the federal government. The rest of Canada sector is composed of all persons, governments and businesses belonging to, or resident in, any of the provinces of Canada except Ontario, with each economic unit of the rest of Canada being defined similarly to the corresponding sectors of Ontario. The rest of the world sector compares exactly with the non-resident sector of the national accounts and includes all persons who are not normally resident in Canada and all governments and business located outside of the geographical boundaries of Canada.

The Transactions

As the provincial accounts are basically derived from the decomposition of the aggregate national estimates, the national accounts definitions of the various components of income and expenditure are retained in general at the provincial level. However, certain modifications had to be made in the conceptual treatment of the intersectoral transactions at provincial level.

An important difference between the Ontario and the national accounting systems stems from the conceptual treatment of the various non-resident sectors identified separately for the province. It should be noted that national transaction data have been decomposed to arrive at the corresponding

Ontario components. In general, the criterion used to determine the Ontario share is whether the transacting unit is resident or non-resident independent of the location where the physical output associated with the transaction is produced. In other words, the "national" basis rather than the "domestic" basis is emphasized in the provincial allocation of national totals. However, in the final consolidation, appropriate adjustments are made to convert the "gross product" from a "national" to a "domestic" concept.

The distinction between the "national" and "domestic" concepts of gross product adopted in the provincial accounts is not strictly analogous to the corresponding conceptual treatment accorded at the national level. In the national accounts, adjustments are made only for certain investment incomes — mostly interest and dividends. Other factor incomes such as wages and salaries received from, and paid to, non-residents are ignored on the grounds that they are relatively insignificant for purposes of converting gross product from a "national" to a "domestic" basis and vice versa. Adoption of a similar convention at the provincial level would obviously distort the measure of total product. For example, the federal-provincial or interprovincial wage payments (or receipts), can hardly be regarded as insignificant. Accordingly, exports and imports are redefined to include, in addition to the trade flows of goods and services, the flows of all factors of production as far as they could be identified.

The transactions with all non-resident sectors are uniformly classified into three groups: factor incomes received or paid, receipts or payments for goods and services other than factors of production, and transfer payments. The first group of transactions is applied to adjust gross product from a "national" to a "domestic" basis and vice versa, while the first and second groups together determine the trade balance in the expenditure approach to provincial product estimation. The transfer items are excluded from both the income and expenditure aggregates.

A different conceptual treatment is used for interest on the public debt. Interest on the public debt is generally conceived as a transfer payment since it does not represent payment to factors of production and involves no exchange of goods or services produced within the economy. This approach would be appropriate for a closed economy with no transactions taking place with non-residents.

But, in an open economy, a portion of interest on the public debt is received by non-residents and, to this extent, it does not constitute merely a transfer of money but a potential claim on domestically-produced goods and services. Moreover, from the point of view of the government, borrowing abroad differs significantly from domestic borrowing. On the basis of these considerations, the portion of interest on the public debt paid to non-residents is recorded in the national accounts as part of the earnings of non-residents and is included in imports as a factor payment; it is considered as a charge against domestic product but not as a part of Canada's national income.

A straightforward extension of this approach to the provincial level would be inappropriate for various reasons. At the national level, the choice of treating interest on the public debt paid to non-residents as a transfer payment or as a factor income is not of great importance because of the relatively small magnitudes involved. However, at the provincial level, the corresponding amounts are of much greater significance, especially when the federal government and the rest of Canada are regarded as non-resident.

In the Ontario provincial accounts all payments of interest on the public debt, to both residents and non-residents, are regarded as transfer payments. Interest payments made by the Ontario government to non-residents either abroad or in the rest of Canada can at best be considered as a transfer of money or claims on money. Such payments convey no potential claim on domestically produced output, in the sense that the corresponding receipts need not necessarily be used to purchase goods and services produced only in Ontario. On the same basis, interest on public debt received by Ontario residents from non-residents such as the federal government or rest of Canada governments cannot be conceived as an addition to the provincial product.

Prior to the DBS revisions, interest and dividend payments to non-residents in the national accounts were measured net of withholding taxes, which in turn were treated as part of federal government investment income received directly from the business sector. However, in the revised format, withholding taxes are regarded as part of the income accruing to non-residents. Thus, all incomes paid to non-residents are measured gross of withholding taxes. However, there

is no corresponding entry for the withholding tax component in the federal government account of transactions with Ontario, since it reflects only an intersectoral transfer between the federal government and non-residents abroad.

The treatment of capital formation and physical change in inventories in the provincial product estimation differs significantly from that in the national accounts. In the national accounts, these items are considered on a domestic basis in the sense that the corresponding goods are physically located within the geographical boundaries of Canada (regardless of their ownership status). This implies that any acquisition of capital goods abroad by the business sector would not be regarded as part of domestic capital formation nor as imports unless the goods in question are physically brought into Canada. The corresponding expenditures are regarded as financial flows and hence would be included in the "surplus on current account with non-residents" which is added to domestic capital formation in the consolidation of the saving and investment account. The extension of this approach to the provincial level not only involves statistical problems of measurement but appears to be inappropriate, especially in view of the extent of interprovincial operations of large multi-regional companies.

Thus, in the provincial accounts investment is measured on an ownership basis rather than on the physical location of assets. Business gross investment in fixed assets is defined as including all capital expenditures made in Canada by the business sector of Ontario, regardless of the operational location of the corresponding assets. This investment concept does not correspond to the conventional definition, since it excludes capital expenditures related to the transfer of existing assets as well as acquisitions of capital goods abroad. A similar concept using the ownership criterion is adopted for defining the physical change in inventories.

ESTIMATION PROCEDURES

At the national level, essentially two broad approaches are used to arrive at the measure of gross product, the "income" approach and the "expenditure" approach. In principle, both approaches can be adopted at the provincial level. The "income" approach involves aggregation of various factor incomes to arrive at net product at factor cost, which adjusted for capital consumption allowances,

indirect taxes and subsidies yields the gross product at market prices. The "expenditure" approach, on the other hand, sums final purchases by all residents to which the total exports less imports and the change in inventories are added to arrive at gross expenditure. Theoretically, these two methods should yield identical measures. However, in practice these aggregates differ, resulting in a statistical discrepancy. The difference is divided into two equal parts and posted as a "residual error" so as to make the measures of both gross product and gross expenditure identical.

Gross Provincial Product for Ontario is arrived at by using both approaches since the estimates are essentially derived from a detailed analysis of sector accounts. The provincial sector accounts are estimated by allocating each transaction presented in the corresponding national sector accounts. All transactions at the national level can be grouped into three categories: transactions between two distinct sectors, transactions between units within a single sector, and accrual items consisting essentially of business investment and capital formation.

A typical intersectoral transaction at the national level can be conceived in two different ways for purposes of provincial allocation. First, from the point of view of the recipient, the total amount involved can be regarded as received by the corresponding Ontario and non-Ontario sectors. Secondly, from the point of view of the disbursing unit, the same amount can be regarded as paid by the corresponding Ontario and non-Ontario sectors. Thus, an intersectoral transaction at the national level, say between sectors X and Y, can be disaggregated into four different components.

Disbursing Unit Y	Receiving Unit X		
	Ontario	Non-Ontario	Total
Ontario			
Non-Ontario			
Total			

This two-way classification was generally adopted for allocating all intersectoral transactions available at the national level to the Province of Ontario. However, exceptions to this general rule were made in specific cases. Marginal allocations both from the recipient's and disbursing unit's point of view for certain components such as personal income and its major parts were available in the

national accounts. Other intersectoral transactions, for which no such provincial breakdown is directly available, were allocated on the basis of supplementary information available from published and unpublished sources. For example, almost every component in the government sector accounts (provincial and municipal governments and hospitals only) was disaggregated into Ontario and rest of Canada shares on the basis of the available information on government finance.

Using the marginal totals of the tables for each intersectoral transaction as necessary constraints and possible guidelines, the respective distributions among the inner cells as per the above lay-out were made. For this purpose, appropriate ratios were derived for each component, either on the basis of auxiliary information or by making specific assumptions. For example, net income received by farm operators or by non-farm unincorporated business in Ontario was assumed to be entirely generated within Ontario and recorded directly as a payment by the Ontario business sector. However, for other components such as wages, salaries, and supplementary labour income, and intersectoral purchases of goods and services, a complete four-way allocation as per the above lay-out was made.

However, this approach is not applicable to transactions within a single national sector. First, almost all intra-sectoral transactions such as intra-business purchases of goods and services or intra-governmental transfers are assumed to cancel out and hence are not shown explicitly in the national accounts. One of the most important exceptions to this general format is direct services of persons which is shown explicitly as an intra-personal transaction in the national accounts since it constitutes a factor income. It was assumed that interprovincial intra-personal wage payments are not significant, at least in the net sense. Accordingly, the value of direct services of persons in Ontario is derived residually from the wages, salaries, and supplementary labour income allocated by province, after deducting the corresponding receipts from other sectors. An alternative estimate was also derived as a component of personal consumption expenditure and compared with the former estimate prior to selecting the most appropriate measure.

All intra-governmental transfer payments made by the Ontario provincial government

conceptually cancel with the corresponding receipts of Ontario municipalities and hospitals and vice versa. However, net transfer receipts from the federal government were explicitly estimated on the basis of the available information on government finance. On the other hand, no adequate estimate of interprovincial intra-business purchases of goods and services could be made due to lack of data in this area. The exclusion of this component from the provincial accounts does not seriously affect the aggregate measure of Gross Provincial Product. Such transactions are likely to take place on balance in a net sense, implying that purchases are of the same magnitude as the corresponding sales. This tends to understate exports and imports, although the error involved is not necessarily of the same order of magnitude, since the corresponding trade in consumption goods and services has already been taken into account in the allocation of the appropriate intersectoral transactions.

An entirely different approach to provincial allocation was adopted for the income and expenditure components which are shown as transactions strictly in the accounting sense and do not represent payments (or receipts) between one sector and another; examples of such items are corporate profits, capital formation, value of physical change in inventories, and capital consumption allowances. A fairly comprehensive analysis of corporate profits and related data such as corporate taxes and dividends was made. It should be recalled that the Ontario corporate sector has been defined on the basis of its legal entity. Thus, an Ontario corporation may operate within the geographical boundaries of Ontario and maintain establishments outside of Ontario. This definition applies also to non-Ontario corporations. Thus, total corporate profits at the national level can be split into a two-way classification.

Profits earned	Profits of Corporations of		
	Ontario	Rest of Canada	Total
In Ontario			
Outside Ontario			
Total			

The Department of National Revenue provides information on the marginal distribution of Canadian corporate profits compatible with this classification. This provincial

breakdown together with supplementary information on the provincial assessment of corporate taxes yields the allocation for the inner cells. Corporate taxes have been estimated as payments to the federal government and to the Ontario and rest of Canada provincial governments respectively. Under the existing legislation, a corporation pays provincial taxes only on that portion of profits which is earned in a particular province. Differential provincial tax rates have been taken into account in the estimation procedures. Dividends paid by Ontario and rest of Canada corporations are distributed among recipients in Ontario, the rest of Canada, and the rest of the world.

In order to allocate capital formation and changes in inventories, a distinction was made between the ownership of assets and the physical location of assets. Thus, total business capital formation at the national level can be decomposed into four parts:

Capital Formation located	Capital Formation by		
	Ontario business	R.O.C. business	Total business
In Ontario			
Outside Ontario			
Total			

The corporate profit analysis with appropriate adjustments made to account for the unincorporated business sector provided the necessary basis for the allocation of investment by ownership status, while the distribution by location is obtained on the basis of published information on public and private investment in Canada. This information was then used to allocate provincially capital consumption allowances and other related data. A similar procedure was adopted for value of physical change in inventories as well as for inventory valuation adjustments attributable to the Province of Ontario.

THE SECTOR ACCOUNTS

The various income and expenditure components and the intersectoral transactions are arranged in the form of eight basic accounts for the Province of Ontario. A double-entry bookkeeping system is maintained throughout, thus balancing total revenue (or receipts) with total expenditure (or payments) for each account.

The structure of the Ontario sector accounts resembles more closely the original

rather than the revised format of the national accounts. The unrevised format was adopted because of the conceptual and statistical limitations associated with the revised format at the provincial level, particularly the detailed estimation of the financial flows, and the conceptual separation of the current account from the capital finance account.

Current Account: Personal Sector

All incomes received by and accrued to all residents of Ontario classified to the personal sector as defined earlier are collected in this account. The main components of personal income are defined identically with those in the national accounts.

Wages, salaries and supplementary labour income and transfer payments are allocated to domestic and non-domestic sources, with the particular economic units specified within the rest of Canada sector. Intra-personal wage payments taking place between Ontario and other provinces are not likely to be of significant order. Similarly, the rest of Canada governments are assumed to conduct their operations within the geographical boundaries of their respective provinces and to employ no residents of Ontario and vice versa.

No further sectoral breakdown of net income of non-farm unincorporated business including rent and net income of farm operators from farm production was attempted since they are assumed to be generated within the Ontario business sector. Interest, dividends and miscellaneous investment income of persons was analyzed by sector as part of the Investment Income Appropriation Account.

On the debit side of this account, all expenditure items of the personal sector are balanced against total personal income to derive personal net saving. The component definitions are again comparable to those used in the national accounts. All items are broken down into payments to domestic sectors and to non-residents. Employer and employee contributions to social insurance are treated in accordance with the DBS revisions as part of personal income and deducted as transfers on the expenditure side.

Current Account: Government Sector

This account shows the combined current revenue and expenditure of the provincial and all local governments and includes public hospitals starting with 1961. It consoli-

dates estimates for each level of government by grouping together certain basic transactions and indicates the intersectoral flows of transactions.

Taxes and other transfers paid by persons originate by definition from Ontario residents only, whereas direct and indirect business taxes are allocated between Ontario and rest of Canada sources. Direct corporate taxes are calculated on a "liability" rather than on a "collections" basis and therefore include the excess of tax liabilities over collections which are not distinguished separately in the provincial accounts.

No sectoral breakdown of government investment income has been attempted. Although it can be assumed that the remitted profits of government business enterprises are generated entirely within the Ontario business sector, interest and miscellaneous investment income can conceivably be received from other sectors as well. Because of the statistical problems involved, both these receipts are merged together with all other provincial investment income components and analyzed collectively for sectoral origin in the Investment Income Appropriation Account.

Included in current revenue are transfers received by all levels of Ontario government from the federal government. In the national accounts, all intergovernmental transfer receipts cancel with the corresponding payments in their consolidation. However, aggregation at the provincial level cancels only those transfers among the Ontario provincial and local governments and Ontario public hospitals.

The intersectoral division of current purchases of goods and services from persons and business is shown and they are taken as net of government sales to the corresponding sectors. As in the revised national accounts, capital consumption allowances are conceived of as current purchases by government from itself for use of own capital. The remaining items are transfers of interest on the public debt, subsidies, capital assistance and various other payments to persons. These are divided between resident and non-resident recipients except for the last item, other transfers to persons, which is assumed to be made to Ontario persons only.

The saving item represents the surplus (+) or deficit (—) on current account and is essentially defined as a balancing item. Saving as shown here differs from the overall

government surplus or deficit by the amount of government capital expenditures.

Operating Account: Business Sector

This account summarizes the transactions of the Ontario business sector as they relate to the employment of the factors of production. The output of this sector combined with direct imports of goods and services constitutes the total value of sales by the business sector. After allowing for sales to the personal, government and non-resident sectors, the residual is treated as retained within the business sector in the form of accumulated inventories or investment in fixed assets.

Although the conceptual treatment of this account is analogous to that in the national accounts, certain major modifications were made to accommodate the specific definitions adopted for the Ontario business sector and to recognize the extent of interprovincial transactions. At the national level, all intra-business purchases and sales of goods and services cancel in the aggregation process. While intra-business purchases and sales of goods and services within Ontario could be ignored in developing the provincial accounts, the same is not true of sales and purchases between Ontario and the rest of Canada business sectors. Another distinguishing feature of this account is the different conceptual treatment of investment in fixed assets and inventories, as outlined earlier, with ownership rather than location adopted as criterion.

On the revenue side, sales of capital goods are the only interprovincial transactions between businesses which are shown separately. Interprovincial trade among businesses in consumption and intermediate goods could not be taken explicitly into account because of data limitations and statistical problems of measurement. However, the error implied by this exclusion is not expected to be very significant at the aggregate level.

Ontario business sales of consumption and intermediate goods and services to rest of Canada business is offset at least to some degree by a similar flow of goods and services into Ontario, while estimation of consumption expenditures from the buyer's side is assumed to cover purchases from all businesses in Canada. Thus, exclusion of intra-business interprovincial trade in consumption goods is expected to distort only slightly the intersectoral allocation of certain operating account components but not to affect the total magnitudes of these components. The over-

all implication of these exclusions is that the provincial export and import series may be understated, although the error on net balance is likely to be insignificant.

The expenditure side of this account lists those cost items which determine the value of goods and services produced. Included here are both factor costs and other indirect costs which represent a part of the market prices of goods and services. The net difference between total revenue and expenditure is divided into two equal parts and recorded as "residual error" to balance the two sides of the account.

Investment Income Appropriation Account

The Investment Income Appropriation Account collects all elements of investment income and traces their disposition to the various sectors. On the source side, investment income is classified according to the resident status of the disbursing units, with the sectoral identification of the corresponding income recipient indicated wherever statistically feasible. One major investment income component received from the rest of Canada requires some discussion. Ontario corporate retained profits accrued in the rest of Canada represent that portion of total retained profits arising from operations in other provinces. Thus, this item must be deducted from total investment income to arrive at the domestic component. Correspondingly, that portion of the retained profits of rest of Canada corporations accrued in Ontario must be considered as part of Ontario's investment income and recorded as a factor payment to the rest of Canada business sector.

The disposition of total investment income, whether originating in Ontario or elsewhere, is shown in a comprehensive form. Individual components are essentially identified from the recipient's point of view. Although at the national level all intercorporate payments and receipts of dividends cancel out, they must be shown explicitly when dealing with a province. The net balance of receipts over payments forms a part of investment income received by Ontario business.

Interest on the public debt paid to Ontario residents by all governments and interest on the consumer debt received by Ontario business must be deducted since they do not constitute part of the production of goods and services and are excluded from total investment income.

Provincial Saving and Investment Account

In this account, the savings attributable to the various sectors of the Ontario economy are brought together to yield total provincial saving. This total is distributed between investment expenditures of Ontario residents (for fixed assets and inventory accumulation) and the surpluses (or deficits) on account with non-residents which represent net foreign investment (or disinvestment) by Ontario residents.

Non-resident Sector Accounts

These accounts are prepared separately for the federal government, the rest of Canada, and the rest of the world and can easily be generated from the other five accounts within the framework of the double-entry book-keeping system. The balancing item on each non-resident account is posted on the credit side and represents the excess of total payments made by Ontario over the corresponding total receipts.

CONCLUSION

The estimation of reliable time series on provincial income and expenditure and the development of a comprehensive set of economic accounts revealing the intersectoral and interregional flows of product is of major significance for economic analysis. While national income and related aggregates are estimated with a fairly high degree of accuracy and in considerable detail, such estimates at the provincial and sub-provincial levels are virtually non-existent.

Although the Dominion Bureau of Statistics publishes total personal income and its major components by province, the majority of economic account components are available only at national level.

It is in this context that the Economic Analysis Branch of the Economic and Statistical Services Division has initiated the design and estimation of a set of economic accounts for Ontario. This attempt should be interpreted as exploratory in nature, recognizing that the estimates are subject to revision. A significant improvement in the estimation of provincial economic accounts could be accomplished if DBS were to enlarge its scope of operations by providing more detailed data at provincial level in addition to existing provincial personal income. This would facilitate the adoption of a uniform and consistent conceptual framework of income and product estimates by all provinces.

Provincial Income and Gross Provincial Product, 1957-1969

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Wages, salaries and supplementary labour income	7,027	7,260	7,747	8,126	8,437	9,057	9,716	10,616	11,875	13,428	14,755	16,193	18,216
2. Military pay and allowances	165	172	170	172	189	201	206	208	205	229	250	256	291
3. Corporate profits before taxes	1,674	1,679	1,979	1,851	1,923	2,146	2,473	2,842	3,089	3,250	3,185	3,497	3,693
4. Intercompany dividends received from R.O.C.	172	168	160	247	275	271	276	337	294	357	386	420	460
5. <i>Deduct:</i> Dividends paid to non-residents	-518	-503	-523	-588	-662	-680	-741	-862	-880	-983	-1,031	-1,074	-1,084
6. Interest and miscellaneous investment income	355	375	354	400	434	528	574	584	657	777	863	990	1,151
7. Accrued net income of farm operators from farm production	272	330	257	268	285	310	284	270	308	407	336	367	450
8. Net income of non-farm unincorporated business including rents	1,049	1,102	1,133	1,094	1,116	1,098	1,227	1,267	1,359	1,446	1,566	1,683	1,751
9. Inventory valuation adjustment	-27	-17	-51	-6	-19	-50	-101	-54	-141	-145	-143	-141	-243
10. <i>Net Provincial Income at Factor Cost</i>	10,169	10,566	11,226	11,564	11,978	12,881	13,914	15,208	16,766	18,766	20,167	22,191	24,685
11. Indirect taxes less subsidies	1,696	1,711	1,885	1,926	2,045	2,306	2,483	2,735	3,157	3,457	3,768	4,140	4,559
12. Capital consumption allowances and miscellaneous valuation adjustments	1,628	1,620	1,759	1,827	1,833	1,985	2,122	2,299	2,496	2,709	2,947	3,104	3,343
13. Residual error of estimate	+291	+163	-41	-17	+154	-156	+180	+61	+58	+410	+221	+131	-94
14. <i>Gross Provincial Product at Market Prices</i>	13,784	14,060	14,829	15,300	16,010	17,016	18,699	20,303	22,477	25,342	27,103	29,566	32,493

Gross Provincial Expenditure, 1957-1969

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Personal expenditure on consumer goods and services	8,154	8,732	9,147	9,478	9,655	10,320	11,062	11,758	12,898	14,216	15,447	16,633	18,111
2. Government expenditure on goods and services													
3. Current expenditure	772	871	956	1,057	1,453	1,575	1,779	1,883	2,002	2,449	2,734	3,136	3,557
4. Capital expenditure	463	480	500	486	483	616	687	640	802	934	897	903	912
5. Business gross investment in fixed assets													
6. New residential and non-residential construction	1,941	1,978	1,787	1,664	1,634	1,610	1,759	2,068	2,306	2,699	2,795	3,051	3,360
7. New machinery and equipment	1,165	939	992	1,031	974	1,064	1,181	1,468	1,803	2,169	2,202	2,066	2,373
8. Value of physical change in inventories													
9. Non-farm business inventories	121	-132	221	13	259	111	313	174	531	453	154	215	232
10. Farm inventories and grain in commercial channels	335	-34	-144	67	148	-294	-35	71	-52	87	62	-41	351
11. Exports of goods and services	7,081	7,053	7,575	7,833	8,332	8,878	9,598	11,192	12,295	14,094	15,263	16,878	18,455
12. Deduct: Imports of goods and services	-5,957	-5,665	-6,247	-6,346	-6,775	-7,020	-7,465	-8,890	-10,051	-11,349	-12,230	-13,144	-14,953
13. Residual error of estimate	-291	-162	+42	+17	-153	+156	-180	-61	-57	-410	-221	-131	+95
14. Gross Provincial expenditure at market prices	13,784	14,060	14,829	15,300	16,010	17,016	18,699	20,303	22,477	25,342	27,103	29,566	32,493

Relation between Net Provincial Income at Factor Cost, Personal Income, Personal Disposable Income, and Personal Saving

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Net Provincial Income at Factor Cost	10,169	10,566	11,226	11,564	11,978	12,881	13,914	15,208	16,766	18,766	20,167	22,191	24,685
2. <i>Add:</i> Transfer payments (excluding interest on the public debt and transfers from Ontario corporations)	664	821	956	1,055	877	926	990	1,057	1,146	1,275	1,631	1,911	2,192
3. <i>Add:</i> Interest on the public debt	280	303	384	405	436	473	501	553	598	653	695	754	843
4. <i>Add:</i> Interest on the consumer debt	55	60	73	83	87	93	99	106	122	138	148	164	188
5. <i>Deduct:</i> Earnings not paid out to persons	-1,258	-1,281	-1,526	-1,472	-1,482	-1,628	-1,825	-2,188	-2,279	-2,399	-2,326	-2,650	-2,804
6. <i>Equals:</i> Personal Income	9,910	10,469	11,113	11,635	11,896	12,745	13,679	14,736	16,353	18,433	20,315	22,370	25,104
7. <i>Deduct:</i> Personal direct taxes	-1,110	-1,020	-1,110	-1,266	-1,329	-1,418	-1,502	-1,736	-2,011	-2,579	-3,067	-3,668	-4,530
8. <i>Deduct:</i> Other current transfers to government	-35	-37	-128	-128	-136	-140	-147	-182	-223	-230	-221	-321	-430
9. <i>Equals:</i> Personal Disposable Income	8,765	9,412	9,875	10,241	10,431	11,187	12,030	12,818	14,119	15,624	17,027	18,381	20,144
10. <i>Deduct:</i> Personal expenditure on consumer goods and services	-8,154	-8,732	-9,147	-9,478	-9,655	-10,320	-11,062	-11,758	-12,898	-14,216	-15,447	-16,633	-18,111
11. <i>Deduct:</i> Transfers to corporations (Interest on consumer debt)	-47	-52	-63	-73	-74	-79	-82	-88	-103	-117	-126	-139	-161
12. <i>Deduct:</i> Transfers to rest of the world	-36	-37	-40	-40	-36	-37	-42	-42	-44	-45	-55	-44	-49
13. <i>Equals:</i> Saving of persons and unincorporated business	528	591	625	650	666	751	844	930	1,074	1,246	1,399	1,565	1,823

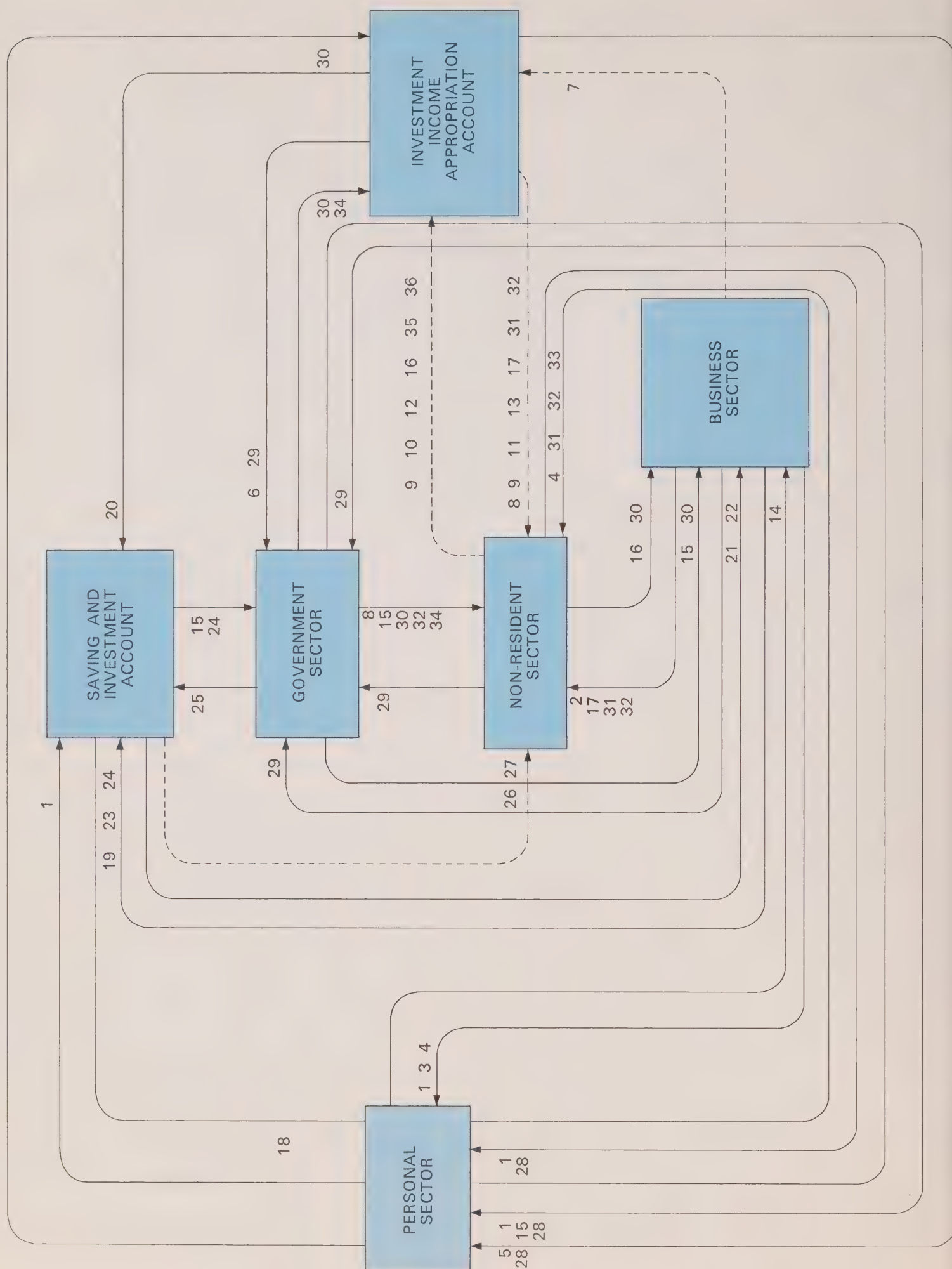
Matrix of Sectoral Transaction Flows

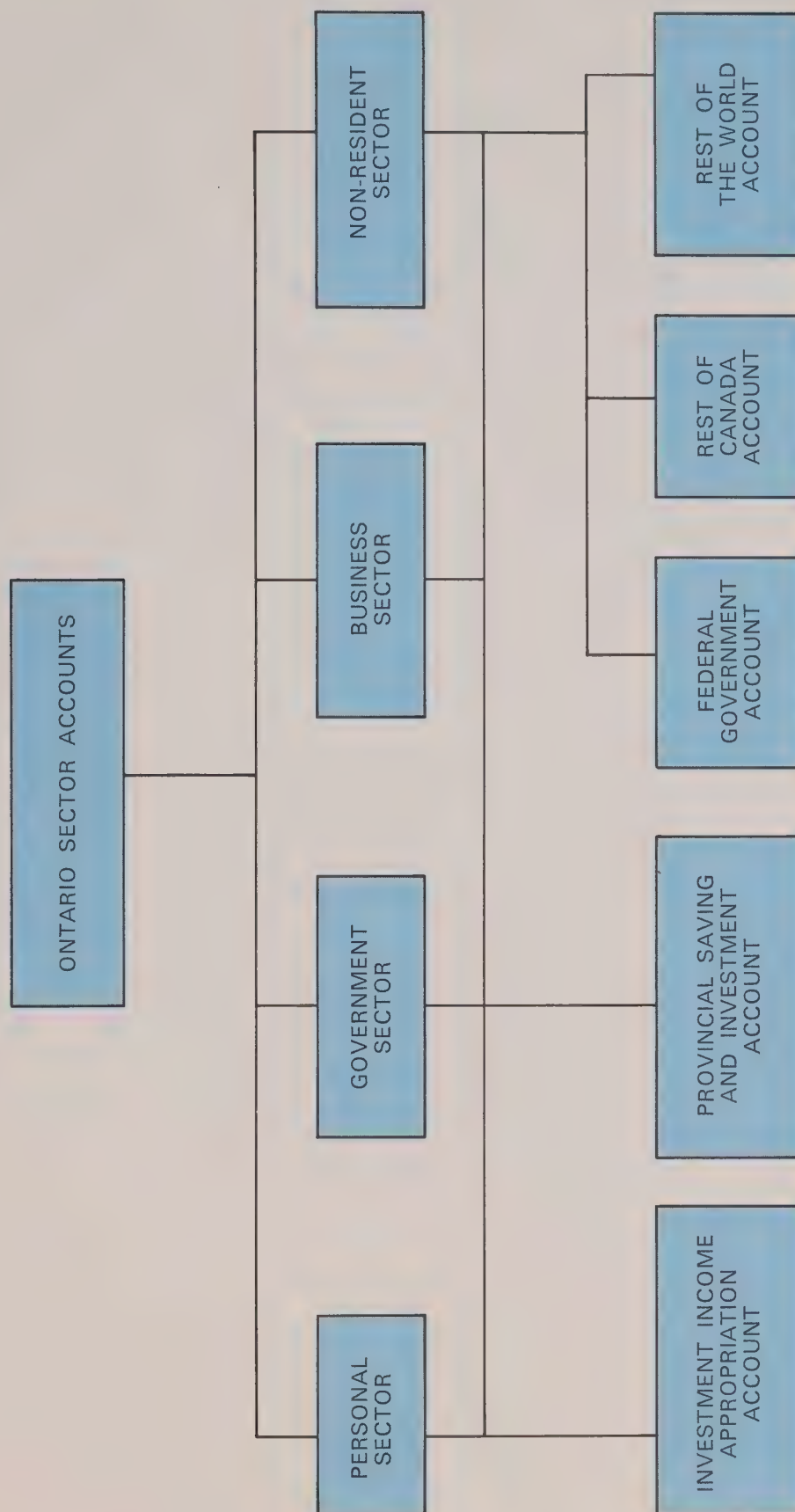
Sector Accounts

Type of Transaction	Personal Sector		Government Sector	
	S ³	D ⁴	S	D
FACTOR INCOMES				
1. Wages, salaries and supplementary labour income of Ontario persons	X	X		X
2. Wages, salaries and supplementary labour income of rest of Canada residents				
3. Net income of non-farm unincorporated business including rent	X			
4. Net income of farm operators from farm production	X			
5. Interest, dividends and miscellaneous investment income of Ontario persons ¹	X			
6. Ontario government investment income			X	
7. Domestic investment income				
8. Federal government investment income ¹				X
9. Intercompany dividends				
10. Ontario corporate retained profits accrued in rest of Canada				
11. Rest of Canada corporate retained profits accrued in Ontario				
12. Corporate dividends to persons from rest of Canada				
13. Corporate dividends to rest of Canada from Ontario				
PURCHASES OF GOODS AND SERVICES				
14. Personal expenditure on consumer goods and services	X	X		
15. Government expenditure on goods and services	X			X
16. Exports of goods and services				
17. Imports of goods and services				
FINANCIAL FLOWS				
18. Personal net saving		X		
19. Government net saving				X
20. Business net saving				
21. Business investment in fixed assets ²				
22. Value of physical change in inventories ²				
23. Inventory valuation adjustment				
24. Capital consumption allowances				X
25. Surplus (+) or deficit (—) on federal government account				
26. Surplus (+) or deficit (—) on rest of Canada account				
27. Surplus (+) or deficit (—) on rest of the world account				
TRANSFER PAYMENTS				
28. Transfers to personal sector	X			X
29. Transfers to government sector		X	X	
30. Transfers to business sector		X		X
31. Transfers to federal government		X		
32. Transfers to rest of Canada		X		X
33. Transfers to rest of the world		X		
34. Interest on the public debt paid by Ontario government				X
35. Interest on the public debt paid by federal government				
36. Interest on the public debt paid by rest of Canada governments				

¹These items include transfers of interest on the public debt which are also covered in Group IV.²These investment items can also be conceived of as purchases of goods and services.³Source⁴Disposition

Note: Numbers to left or above arrows refer to the row identification in the matrix of sectoral transaction flows.





Selected Economic Indicators

Leading Indicators

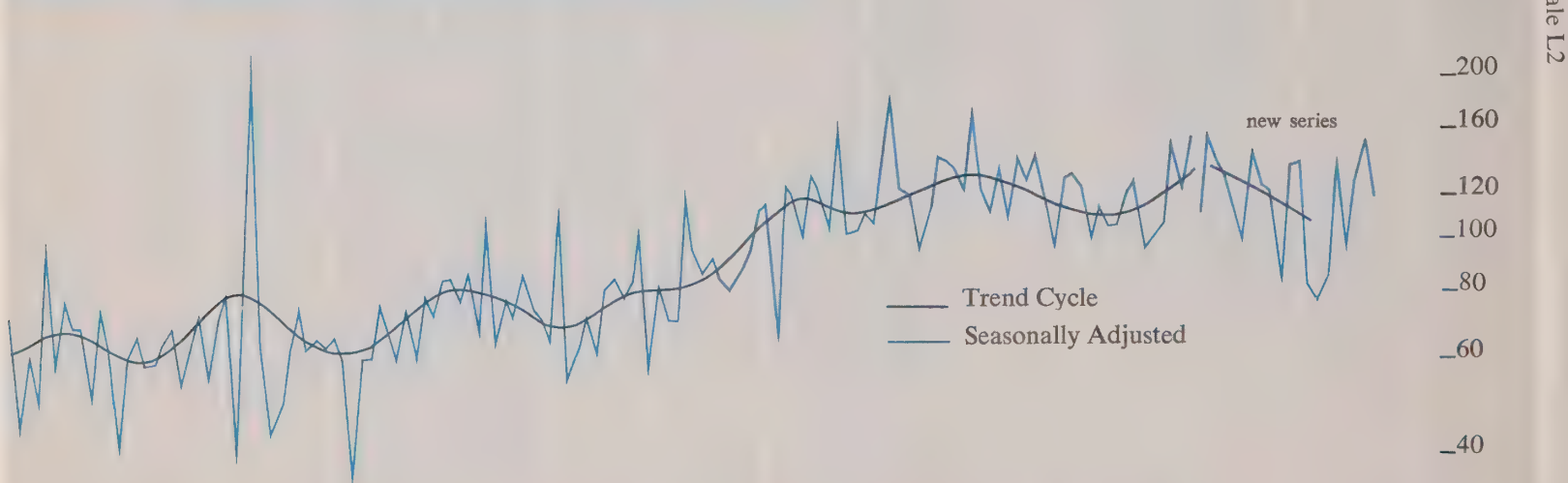
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



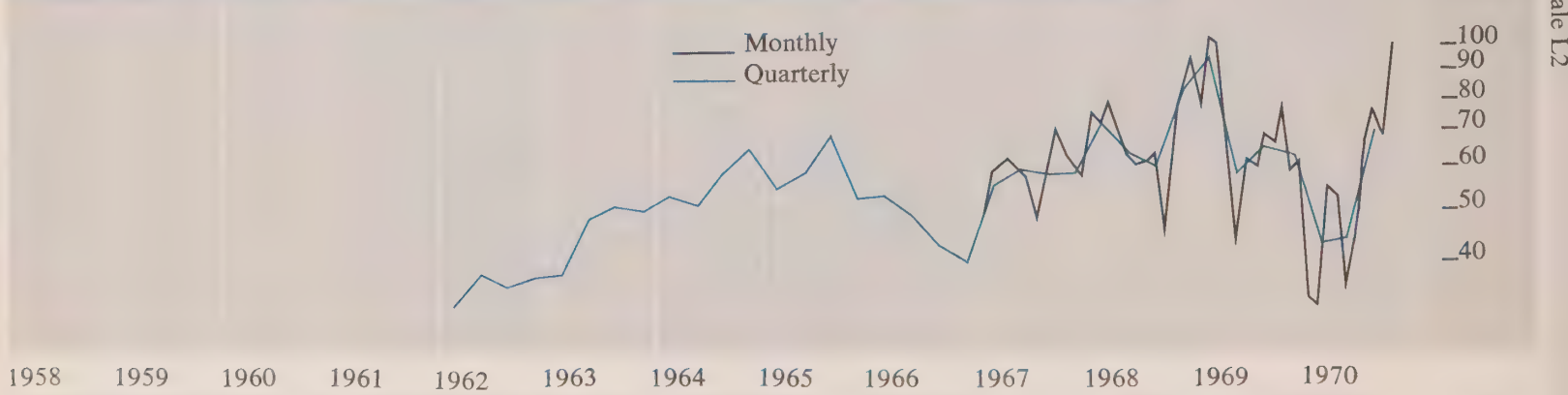
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Commercial/Institutional and Industrial Construction Contracts, Ontario



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

\$ Billion
Scale L1
_30
_25
_20
_15
_14
_13



Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

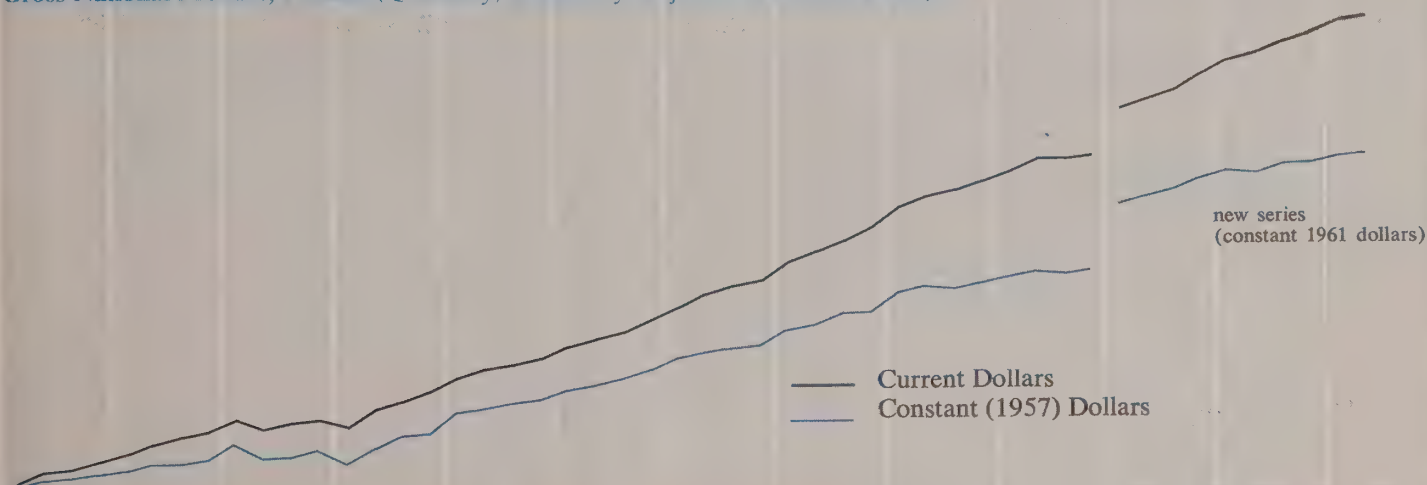
Index
Scale L2
_200
_180
_160
_140
_120
_100



Coincidental and Lagging Indicators

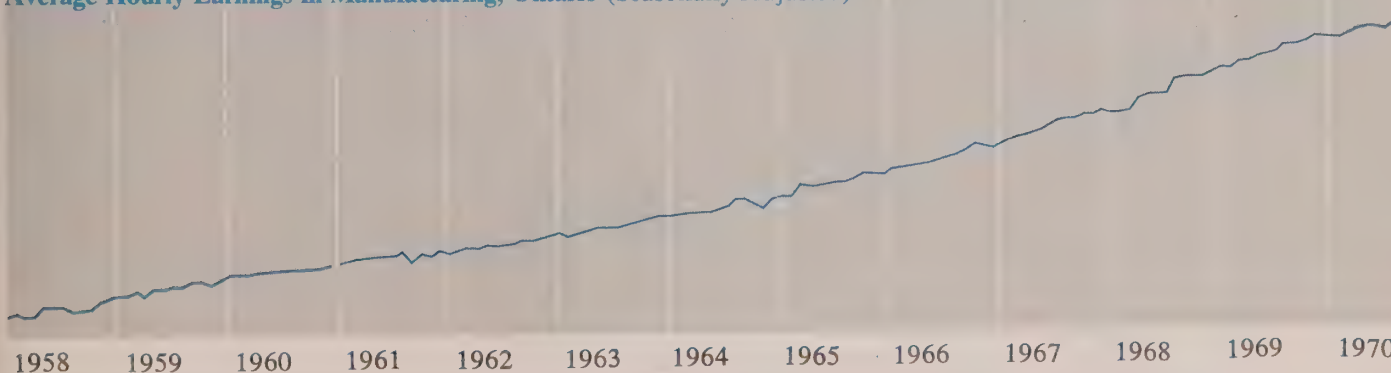
Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion
Scale L1
_80
_70
_60
_50
_40
_35



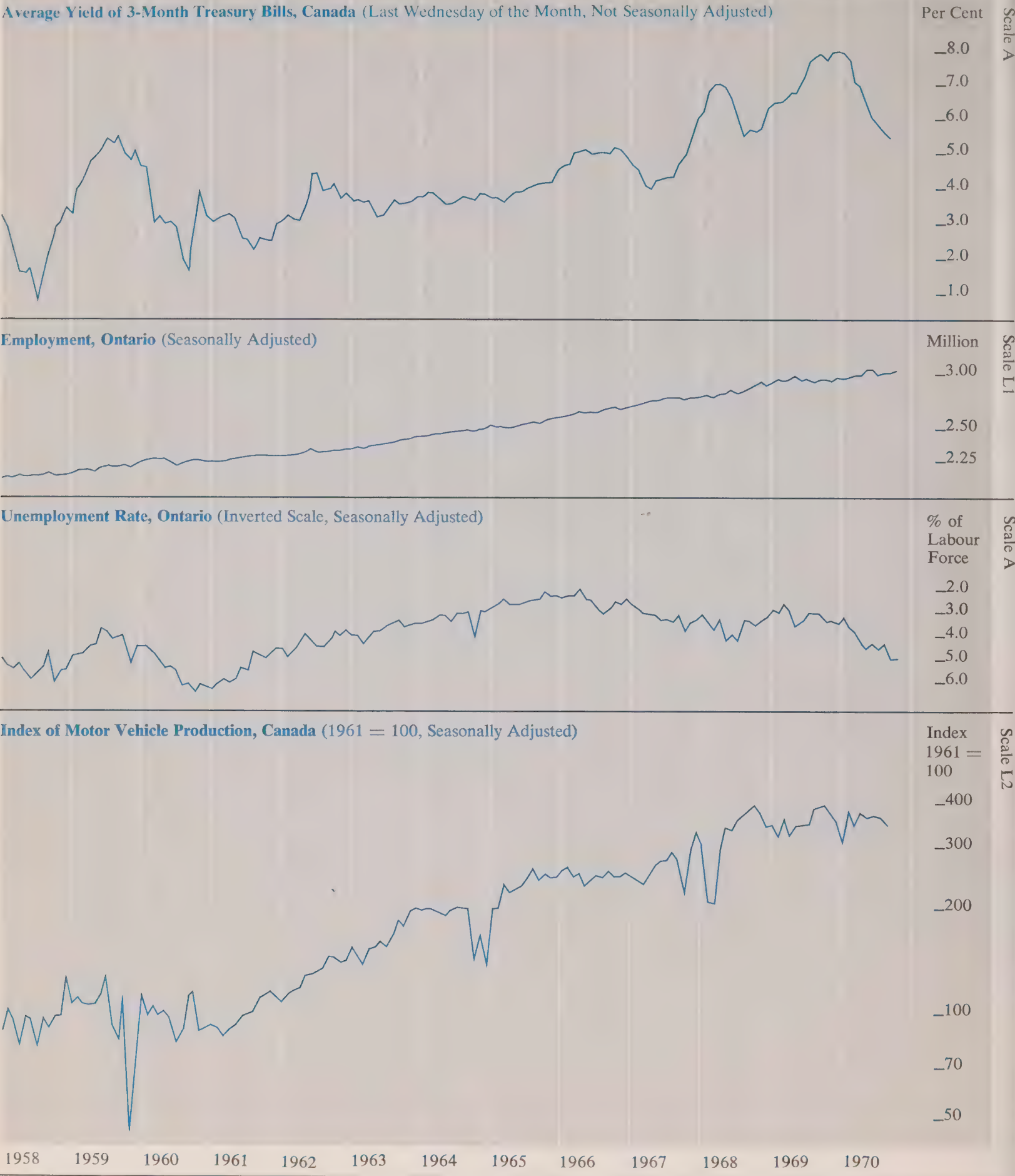
Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)

Dollars
Scale L1
_3.00
_2.50
_2.00



1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970

Coincidental and Lagging Indicators



Economic Indicators

Seasonally Adjusted

	1969					1970									
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	
Leading Indicators															
Average Weekly Hours Worked in Manufacturing	40.3	39.9	39.9	39.4	39.6	39.7	39.5	40.0	40.3	40.4	39.3	40.1	40.8		
New Orders in Manufacturing Industries ^c	3,770	3,634	3,754	3,728	3,662	3,696	3,604	3,650	3,774	3,851	3,804	3,883	3,727		
Commercial/Institutional and Industrial Construction Contracts	123.2	86.6	137.3	140.0	72.1	78.4	87.2	142.2	97.4	130.4	159.4	120.2	118.3		
Urban Housing Starts (Annual Rate)	67,300	78,300	59,100	64,700	34,800	33,600	55,700	53,900	37,200	45,200	67,500	77,500	69,200	106,500	
Money Supply ^c	28,403	28,472	28,580	28,917	28,955	28,947	28,817	28,966	29,223	29,668	29,769	29,996	30,125		
T.S.E. Industrial Index ^u	178.15	182.11	187.65	186.37	177.89	183.92	185.17	171.08	154.21	151.53	157.36	160.28	165.8	162.1	
Business Failures ^u	52	64	54	53	56	71	82	54	65	77	73	48	55		
Business Failures — Liabilities ^u	4.8	3.4	4.6	2.2	9.9	18.7	4.0	2.2	3.4	8.1	3.1	2.8	5.3		
Coincidental and Lagging Indicators															
Gross National Product ^c (Annual Rate)	79,292			80,888			82,660			83,192			84,120		
Average Hourly Earnings in Manufacturing	2.97	2.99	3.02	3.06	3.06	3.05	3.11	3.17	3.19	3.19	3.16	3.21	3.23		
3-Month Treasury Bill Rate ^{c,u}	7.77	7.60	7.76	7.81	7.78	7.60	7.00	6.78	6.34	5.94	5.70	5.51	5.39	5.39	
Cheques Cashed in Clearing Centres ¹	6,570	6,526	6,521	6,240	6,078	6,099	6,661	6,487	6,313	6,386	6,358	6,774			
Retail Trade	901	892	895	909	891	869	884	906	904	887	918	902	930		
Labour Force	3,027	3,035	3,030	3,064	3,044	3,066	3,098	3,111	3,183	3,173	3,122	3,130	3,158	3,179	
Employed	2,932	2,930	2,927	2,957	2,948	2,957	2,981	2,977	3,037	3,038	2,976	2,992	2,998	3,033	
Unemployed	95	105	103	107	96	109	117	134	146	135	146	138	160	146	
Unemployed as % of Labour Force	3.1	3.4	3.4	3.5	3.2	3.6	3.8	4.3	4.6	4.3	4.7	4.4	5.1	5.0	
Wages and Salaries	1,457	1,460	1,487	1,503	1,529	1,549	1,550	1,547	1,571	1,586	1,583	1,599			
Index of Industrial Employment	129.6	130.7	132.7	132.8	132.1	133.0	132.7	132.1	131.7	131.4	131.1	131.7	129.5		
Index of Industrial Production ^c	165.9	165.6	169.3	172.0	171.1	174.4	171.5	172.4	170.5	170.2	170.0	170.9	169.4		
Total Manufacturing ^c	166.8	166.7	169.5	170.7	167.8	171.0	168.1	170.0	167.5	167.4	165.4	166.3	163.5		
Non-Durables ^c	153.0	152.4	153.4	154.3	152.3	154.3	152.8	154.8	155.0	152.4	152.8	151.7	151.9		
Durables ^c	183.8	184.1	189.2	190.7	186.8	191.4	186.7	188.6	182.8	185.8	181.7	184.1	177.7		
Mining ^c	141.8	140.3	151.8	163.4	170.2	175.7	170.6	164.2	166.6	170.8	173.4	174.6	177.4		
Electric Power and Gas Utilities ^c	194.6	195.5	194.6	197.0	201.0	203.0	203.0	206.4	203.7	205.1	206.1	205.9	208.4		
Primary Energy Demand (Annual Rate)	58.39	59.09	59.56	63.13	64.53	63.91	62.94	63.39	61.60	63.35	65.03	65.68	66.80		
Exports (including re-exports) ^c	1,293.4	1,283.0	1,285.0	1,328.9	1,447.0	1,402.1	1,410.1	1,439.0	1,434.1	1,392.2	1,422.7	1,321.1	1,391.3	1,418.0	
Imports ^c	1,220.1	1,206.7	1,223.2	1,215.0	1,116.8	1,230.6	1,242.6	1,191.6	1,207.1	1,182.5	1,187.5	1,162.3	1,184.5	1,066.0	
Unclassified Indicators															
Foreign Exchange Reserves ^{c,u}	2,539	2,629	2,613	2,616	2,698	2,777	2,936	3,179	3,406	3,650	3,689	3,848	3,785		
Industrial Materials Price Index ^{c,u}	270.4	266.8	267.8	271.5	272.3	272.3	275.7	274.4	273.7	271.5	272.3				
Consumer Price Index ^{c,u}	126.6	126.8	127.4	127.9	128.2	128.7	128.9	129.7	129.6	129.9	130.5	130.5	130.2	130.3	

^cStatistics for Canada.

^uNot seasonally adjusted.

¹Ontario less Toronto.

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